REPORTS

ON THE

NATURE OF THE FOOD

OF THE

INHABITANTS OF THE MADRAS PRESIDENCY,

AND ON THE

DIETARIES OF PRISONERS

IN ZILLAH JAILS.

COMPILED AND ARRANGED UNDER THE ORDERS OF GOVERNMENT,

BY

WILLIAM ROBERT CORNISH,

SECRETARY PRINCIPAL INSPECTOR GENERAL MEDICAL DEPARTMENT.

MADRAS:

PRINTED AT THE UNITED SCOTTISH PRESS,

BY GRAVES, COOKSON AND CO.

1863.

TABLE OF CONTENTS.

		Page.
General Report by Assistant Surgeon W. R. Cornish, Secretary Principal Inspector General Medical Department		1
Report of Bellary district	by Dr. Jackson	51
Calicut (Malabar)	by Dr. Cleveland	*ib.*
Cannanore do.	by Dr. Reynolds	54
Chittoor (North Arcot)	by Dr. Gamack	*ib.*
Chingleput (Madras)	by Dr. Shortt	55
Chicacole	by Dr. Rean	60
Cochin	by Dr. Day	61
Combaconum (Tanjore district)	by Dr. W. Doyle	67
Cuddalore (South Arcot)	by Dr. H. E. Busteed	69
Cuddapah	by Dr. Fletcher	70
Coimbatore	by Dr. Ogg	72
Guntoor	by Dr. Croudace	74
Honore (North Canara)	by Dr. A. E. M. Ross	75
Madras	by Dr. Aitken	90
Kurnool	by Dr. DeFabeck	94
Madura	by Dr. Wilson	96
Mangalore (South Canara)	by Dr. Rule	100
Masulipatam (Kistnah district)	by Dr. Robertson	101
Nellore	by Dr. Adam	102
Ootacamund (Neilgherry Hills)	by Dr. Stewart	105
Paumbem	by Assistant Apothecary Sausman	107
Rajahmundry (Godavery district)	by Dr. McDonald	111
Salem	by Dr. Crocker	114
Tranquebar (Tanjore district)	by Dr. Joseph	117
Tanjore Town	by Assistant Apothecary A. Saviel	118
Tellicherry (Malabar)	by Dr. Furnell	120
Tinnevelly	by Dr. Gillies	*ib.*
Trichinopoly	by Dr. J. Dorward	121

Page.

Vizagapatam...........................by Dr. Andrews........................ 122

Vellore (North Arcot)..................by Dr. H. Goodall............................ 124

CORRESPONDENCE.

Extract of letter from Dr. Wyndowe, Civil Surgeon, Calicut........................... 126

Letter from Deputy Inspector General of Hospitals, W. Mackenzie, C. B., A. M. and M. D., forwarding Dr Wyndowe's letter.. 127

Letter from J. Rohde, Esq., Inspector General of Jails, to Principal Inspector General Medical Department... 128

Letter from Principal Inspector General Medical Department, to J. Rohde Esq., Inspector General of Jails 130

Report of J. Mayer, Esq., Chemical Examiner to Government on various questions submitted to him by Principal Inspector General Medical Department......... 131

MEMORANDUM ON THE NATURE OF THE FOOD OF THE INHABITANTS OF SOUTHERN INDIA, AND ON PRISON DIETARIES.

I. The Food and Drink of the People.

Geographical features of the Presidency as influencing climate and natural productions of the soil.

WITHIN the geographical limits of the Madras Presidency, there are living several distinct races of people. The surface configuration of the land of the Peninsula, rising from the sea level to altitudes of from 6,000 to 8,000 feet, gives a greater variety of climate than is usually found in tropical countries. The mean temperature at the sea level may be set down, approximatively, as from 80° to 85°; on the table lands of Mysore and the Deccan, from 70° to 75°; and on the Neilgherry plateau and other mountain ranges, from 56° to 65°.

The food of the population is as diversified as the geographical features of the country, and the influences of caste and race have tended still further to perpetuate distinctions in the kind and quality of substances used as food. The Hindoo, in whatever part of the country he may be living, has been usually regarded as a rice eater. The earlier impressions obtained by travellers with regard to the manners and customs of the country arose from intercourse with the people living on the sea board, and as rice is one of the staple products, and the chief food of the people on the alluvial plains near the coasts of the Peninsula of India, it was erroneously assumed that the whole population of the country were rice eaters. The late Mr. Buckle,* in his attempt to explain the influence of physical laws on the characteristics of

* History of Civilization in England, Vol. I. page 181.

nations, fell into the error of regarding the whole of the inhabitants of India as peculiarly rice eaters. He observes: "From the earliest period the most general food in India has been rice, which is the most nutritive of all the cerealia." And from this erroneous statement of facts he goes on to argue:—

"Thus possible is it, by the application of a few physical laws, to anticipate what the natural food of a country will be, and therefore to anticipate a long train of ulterior consequences."

Mr. Buckle's hasty generalization in this matter arose from the assumption of two fundamental errors as proven facts. In the first place, rice does *not* occupy the position of bread to the English labourer, or of the potatoe to the Irish. It is not the *essential* article of diet to the millions of people who form the bulk of the population; and secondly, the assumption that rice is the most nutritive of all the cerealia is contradicted not only by the experience of those who feed on it, but by scientific analysis of its component parts.

Rice the common staple food on the sea board. Wheat in Northern India and the Deccan. Raggy in Mysore, and the latter grain with Cholum and Cumboo in the interior of the Madras Presidency.

Rice is generally grown on the sea board, and in the alluvial valleys of great rivers, but there are many districts in the interior where it forms but an unimportant item in the natural products of the country. Central India, the North West Provinces, Punjaub, and Nagpore produce more Wheat than Rice, and wheat flour (*Atah*) is there the staple food. In the Gangetic valley, in lower Bengal, and in Burmah rice is extensively grown, and becomes one of the staple articles of food of the people, as well as a chief commodity of export. The sea-board of the Madras Presidency is generally rice-producing, but in the interior other cereals which require less moisture, and which can be grown without artificial irrigation, take the principal place in the dietary of the great bulk of the people. In the Mysore provinces and many of our Collectorates *Raggy* is the grain most generally eaten, and perhaps it is the one most largely used in Southern India as the staple food of the labouring man. In nutritive power it is equal, if not superior to Wheat, the great staple of northern countries, and hence perhaps its very general use by those who have to endure bodily exertion in their daily life.*

To determine the relative quantities of the dry grains and rice produced in this Presidency is by no means an easy task in the absence of statistical tables,

* Dr. Forbes Watson places this grain *below* rice as regards its nutritive value, but his analysis differs so much from Mr. Mayers that it seems probable that there is some error in his mode of calculating the proportion of nitrogen.

showing the average yield of grain of the several districts. The Board of Revenue has obligingly furnished the following statement in illustration of the quantity of land under "wet," "dry," and "garden" cultivation—but this document alone is not sufficient to give any definite idea of the relative quantities of the several species of grain. Rice is generally grown in "wet" land, but one species the "black paddy" is sown on dry lands, and derives sufficient moisture for its growth from the monsoon rains without artificial irrigation. The sugar cane is grown on wet land. The "dry" cultivation includes not only grain, but oil seeds, cotton, indigo, &c., so that a knowledge of the gross average of land under cultivation does not permit of any exact approximation to the quantity of food produced. The gross yield depends moreover so much upon the fertility of the soil and the suitableness of the seasons that the question becomes still more complicated, and a correct solution of it almost impossible. From a statement drawn up by the Director of Revenue Settlement, it seems that the average produce in one district of *Cholum*, varies from 800 measures (about 2,400 lbs.) per acre, to 134 measures (or 400 lbs.) per acre, and that these variations depend upon the nature of the soil; and of irrigated paddy, the average product per acre varies according to soil from 1,200 measures to 400, or 3,600 to 1,200 lbs.

If we allow 1½ lbs. of grain as the average daily consumption of an adult man, an acre of irrigated land will produce enough food to feed from three to seven persons for a whole year. An acre of dry cultivation with an average crop of Raggy, Cumboo, or Cholum will only at the same rate produce food enough for about half the number. The variations in the relative yield of the several grains on different qualities of soil, are so great however, that it is impracticable to do more than give a rough guess at the proportions of rice and dry grains which are consumed. At a rough estimate it may be laid down that land which will produce by the natural moisture of the seasons, food enough for one man, will under irrigation and a constant water supply, bring forth enough to feed three. On a large portion of wet land it must be borne in mind the water supply is insufficient for more than a single crop in the year.

The "Garden" lands are generally irrigated from wells, and being more highly cultivated, the produce is proportionally great. In these lands, tobacco, chillies, vegetables, &c., are principally grown.

To show the disproportion in the nature of the grains produced in the various districts, I have reduced these figures to percentages, which give the relative proportions of each kind of cultivation in 100 acres of soil.

Table showing the extent of land under cultivation in the Madras Presidency, during Fusli 1271.

	Districts.	Dry.	Wet.	Garden.	Total.
		Acres.	Acres.	Acres.	Acres.
1	Ganjam	89,166	1,61,061	2,054	2,52,281
2	Vizagapatam	12,364	14,371	40	26,775
3	Godavery	3,93,161	1,68,113	2,728	5,64,002
4	Kistnah	13,06,970	1,52,611	10,355	14,69,936
5	Nellore	3,96,886	1,06,492	21,840	5,25,218
6	Cuddapah	9,85,228	78,414	45,174	11,08,816
7	Bellary	21,29,894	1,46,891	...	22,76,785
8	Kurnool	10,51,061	19,796	13,904	10,84,761
9	Madras	1,10,653	2,13,555	2,067	3,26,275
10	North Arcot	3,89,703	1,82,784	21	5,72,508
11	South Arcot	7,43,077	2,65,165	3,711	10,11,953
12	Tanjore	2,36,281	7,19,195	32,250	9,87,726
13	Trichinopoly	4,83,063	1,46,928	39,794	6,69,785
14	Madura	4,64,630	1,10,946	27,929	6,03,505
15	Tinnevelly	10,43,802	1,77,913	17,134	12,38,849
16	Coimbatore...	14,70,783	77,462	1,59,438	17,07,683
17	Salem	9,17,284	61,078	14,935	9,93,297
18	North Canara	...	...	...	...
19	South Canara...	...	...	...	...
20	Malabar	...	...	...	...
		122,24,006	28,02,775	3,93,374	154,20,155

Table exhibiting the proportions of dry, wet, and garden cultivation in the several Collectorates of the Madras Presidency, during Fusli 1271.

	Districts.	Average amount of dry cultivation.	Wet. cultivation.	Garden. Cultivation.
1	Ganjam	35·3	63·8	·8
2	Vizagapatam	46·1	53·6	·1
3	Godavery	69·7	29·8	·4
4	Kistnah	88·9	10·3	·7
5	Nellore	75·5	20·2	4·1
6	Cuddapah	88·8	7·0	4·
7	Bellary...	93·5	6·4	....
8	Kurnool	96·8	1·8	1·3
9	Madras	33·9	65·4	·6
10	North Arcot	68·	31·9	....
11	South Arcot...	73·4	26·2	·3
12	Tanjore...	23·9	72·8	3·2
13	Trichinopoly	72·1	21·9	5·9
14	Madura...	76·9	18·3	4·6
15	Tinnevelly	84·2	14·3	1·3
16	Coimbatore	86·1	4·5	9·3
17	Salem	92·3	6·1	1·5
	Total...	79·2	18·1	2.5

From these figures we obtain the remarkable fact that only *one-fifth* of the entire area of cultivated land in the districts named is devoted to the production of rice and sugar, the remaining *four-fifths* being used for the cultivation of the dry cereals, dholl, gram, cotton, oil seeds, &c.

In some districts, as in Cuddapah, Bellary, Kurnool, Tinnevelly and Salem, the proportion of wet cultivation is exceedingly low, thus showing that the great bulk of the food of the people must be derived from the dry grains. In Kurnool for instance, the rice produced in the district cannot under any circumstances be more than sufficient to feed *ten per cent.* of the population, even supposing that one acre of wet land is equivalent to five of dry in food-producing power. The remaining *nine-tenths* of the people must therefore depend upon the dry grains for their staple food or import rice from other districts. The districts on the Malabar Coast are not included in the return furnished by the Board of Revenue, but here it seems probable that the proportions indicated would be reversed.

With regard to the produce of the country, it must be remembered that the dry cereals are all for home consumption, whereas a varying, but large quantity of rice is exported, and the quantities so exported would have to be taken into consideration in calculating the proportion of persons in the rice-growing districts who look to that grain for their principal article of food.* The following statements kindly furnished by the Board of Revenue, show the chief imports and exports of food for the two official years 1860-61, 1861-62. It will be observed that the importation of Paddy and Rice was greater in the latter year, and the exports smaller, showing that from a combination of causes, there was very little surplus grain produced over and above the quantity required for home consumption during the latter year.

Statement of the Imports and Exports of the principal articles of Food in the Madras Presidency.

Imports.				1860-61.	1861-62.
Grain.	Anoomooloo...	Species of gram or dholl	Quarters.	5	25
	Condaloo ...		,,	11	11
	Dholl.. ...		,,	1,900	1,812
	Menoomooloo.		,,	1,365	3,433
	Paddy..		,,	65,368	76,364
	Natcheny (Raggy) ...		,,	...	473
	Peas..		,,	3,044	5,656
	Pessaloo		,,	113	296
	Rice...		,,	47,199	1,50,114
	Senagooloo (Bengal Gram)		,,	2,228	3,690
	Wheat		,,	14,243	13,516
Provisions. ...	Ghee..		cwt.	187	319

* I am informed by Mr. Huddleston, Secretary to the Board of Revenue, that from Malabar and Canara large quantities of fine rice are exported to the Persian Gulf and Coast of Arabia, and that a coarser kind of grain for home consumption is brought down from Mysore, as well as from Bengal and Bombay.

Exports.			1860-61.	1861-62.
Grain. ...	Anoomooloo...	Quarters.	47	815
	Caramunloo...	„	1,016	836
	Condaloo	„	6,526	1,102
	Dholl.	„	1,719	2,445
	Menoomooloo..	„	513	2,210
	Paddy...	„	47,235	47,952
	Natcheny	„	54	108
	Peas...	„	1,736	994
	Pessaloo	„	1,592	2,986
	Rice...	„	5,89,556	3,41,283
	Senagooloo	„	76,390	51,588
	Wheat	„	9,248	9,767
Provisions. ...	Ghee...	cwt.	8,605	5,277

However the forms of food may vary in external characteristics, the frame of man requires certain essential ingredients to be supplied by its means. There must be material to repair the daily waste of tissue, and there must be a different order of material to support the respiratory functions, and the heat and vitality of the body. Nature has wisely provided in the vegetable and animal kingdoms all things necessary to the sustenance of man. The country he inhabits will, as a rule, be found to produce the food best adapted to the conditions in which he exists. In Northern Europe, Barley and Oats are the grains which flourish best. The Wheat countries include much of middle and southern Europe, Central Asia, North America, and Northern India. Maize flourishes largely in Central and Southern America and Africa; Rice in Japan, China, and India; and the Millets are much used in the interior of Southern India. All the *cerealia* contain vegetable albumen, starch, and mineral ingredients, in varying proportions; those which are the richest in nitrogenous compounds, *i. e.*, in albuminous or flesh-forming materials, are, as a rule, the best adapted for the staple food of a people, and the people who use such grains have all the elements of which their bodies are built up contained in their chief article of diet.

Food generally adapted to the nature of the climate.

As regards the labouring population of India, the great bulk of their food is furnished by the staple grain of the district in which they live. Ascending higher in the social scale, the variety of food is extended, and the dietary scale is as complex as that of the rich and luxurious of European nations.

The poverty of the people of Southern India, the chief cause of their consuming so little animal food.

The reports which accompany these observations show that the ordinary bill of fare of a well-to-do Hindoo or Mussulman includes a very great variety of dishes, for the composition of which the animal, vegetable, and mineral kingdoms of Nature are laid under contribution. Although there are no people in India who are strict vegetarians in their diet, yet it may be truly said that there is no country of which we have any record where there is a smaller proportion of animal food consumed by the people generally. The strict Brahmins and Rajpoots, who confine their demands upon the animal kingdom to the use of butter-milk, curds, and eggs,—who eat of nothing which in their estimation contains *life,* are but few in proportion to the Hindoos and Mahomedans who eat moderately as their means will allow of animal food in the shape of mutton, fish, poultry, butter, milk, eggs, &c. These again are not a numerous class in comparison with the bulk of the poor, whose means will not allow of more than a scanty and irregular consumption of animal food to be used with the staple grain of their district; and so it happens that in the aggregate of the population, vegetable food bears a very high proportion to that derived from the animal kingdom.

List of the principal food grains in Southern India.
Natural order, Graminaceæ.

Synonyms of principal food grains.—Nat. Ord. Graminaceæ.

English names.	Botanical names.	Hindustanee names.	Tamil names.
Rice (several sp.)	Oryza Sativa...........	Chawul...........	Aresee.
Raggy..	Elusine Corocana......	Natchene Ragee..	Raggee.
Great Millet.... .	Sorghum Vulgare......	Jowaree...........	Cholum.
Spiked Millet....	Pencillaria spicata....	Bajree..	Cumboo.
Italian Millet....	Panicum Italicum., .	Kalakangnee.. ...	Tenay.
Little Millet......	Panicum Miliaceum...	Sawee Chennawa-[ree.	Varagoo
Wheat.............	Triticum Æstivum.....	Gahoon......	Godoomay.
Barley......... ...	Hordeum hexastichon	Jow	
Indian corn......	Zea Mays....	Mukka Jowaree..	Mukka Cholum

These are the chief of the grain yielding grasses used as food, but there are some other species of Millet grown, such as *Panicum Miliare,* and *P. Frumentaceum.*

The sugar cane is largely cultivated and used as food in the raw state, as well as for the manufacture of sugar. The seeds of the Bamboo (*Bambusa*) are also eaten in times of scarcity, in those districts where the plant abounds.

Next in order to the cereals, with regard to their importance in the dietary of the natives of India, come various plants of the natural order Leguminosæ;

in fact, those of the population who eat sparingly of animal food are compelled by the stern necessities of their being to seek in the plants of this family the amount of nitrogenous material required to renew the waste of tissue constantly going on in their bodies. All the pulses, the peas, beans, gram, and dholl, contain a large per-centage (from 25 to 30) of vegetable albumen, or casein, and also a large proportion of inorganic constituents, and hence their great value as substitutes for animal food. The principal pulses are included in the following list.

Importance of Leguminous plants in the diet of the people who live on grain.

Natural order—Leguminosæ.

Common names.	Botanical names.	Hindustanee names.	Tamil names.
Dholl.........	Cajanus Indicus... ...	Toor Dhall...	Thovary purpoo.
Green Gram............	Phaseolus Radiatus	Hara Moong...	Putcha payroo.
———	————— Mungo...	———	Ooloondoo.
Cooltee................ ...	Dolichos Uniflorus...	Kooltee.................	Kolloo.
Lentil....................	Ervum Lens............	Mussoor.................	———
Bengal Gram...........	Cicer Arietinum... ...	Chenna................	Cuddalay.
Common Pea...........	Pisum Sativum........	Buttamee............ .	———

These substances enter largely into the composition of the vegetable curries, they are also made into thin cakes with pepper and assafœtida, which are fried in butter, and thus eaten. Those who do not use animal food consume from two to four ounces of dholl or some of the lentil tribe per diem, in addition to the ordinary amount of cereal grain.

The animal foods used in Southern India do not differ materially from those of other countries. Of these, butter-milk, and fresh curds are the most universally used by all classes. The wealthier the individual, the more ghee (clarified butter) and butter-milk he generally consumes. The religion of the Hindoos prohibits their eating beef, and the Mussulmans are equally forbidden the use of pork, but with these exceptions the flesh of domesticated animals and of the wild ruminants of the forest is generally eaten. The lower castes and Pariahs even devour horse-flesh, as well as the bodies of cattle which perish from disease.

Animal food.

Along the sea-board, fish of all kinds are used as food, and salted fish finds its way into the interior, being an article of considerable trade in most bazaars. It is a mis-

Fish.

take to suppose that there are any people in India who are absolute vegetarians. Many castes or sects of Hindoos will not eat *flesh*, but such people use butter-milk and curds very liberally in their diet.

No absolute vegetarians in India.

The tribes inhabiting the forests of Southern India live chiefly upon jungle produce, *e. g.*, large and small game, honey, fruits, and the starchy bulbs of various plants. They procure a little rice, salt, tobacco, and betel from the plains, in exchange for the horns, hides, honey, wax, &c., which accrue to them in the chase.

Diet of aboriginal tribes.

The flesh of domesticated animals in India is generally lean, and deficient in succulent juices. This arises from the fact that the feeding of cattle for human consumption is an art not at all understood or practised by the natives. Excellent meat can be obtained by feeding animals with good grasses and grain; "gram fed" sheep turn into mutton of superior quality. The price of meat so improved however puts it out of the reach of all except the wealthy.

Meat generally of inferior quality in India.

The *succulent vegetables and fruits* used as food, are extremely varied and numerous. In the vital economy they supply essentially necessary materials to the blood, and they are very important in relation to the health of the people. A list of the more common of these will be found in the very interesting report by Dr. Shortt. They are arranged in the order of the seasons when they mostly appear. Green vegetables are chiefly used in curries. The ripe fruits are eaten raw to a great extent in their season. Lime juice enters into the composition of nearly all Indian dishes, and the preservative action of this vegetable acid on the fluids of the body is probably very important, where the consumption of large quantities of cereal grain is so common. The general use of the fruit of the tamarind in curries affords also another instance of the craving of the body for sour things, amongst those who eat largely of a grain diet.

Fruits and vegetables.

Vegetable acids important in a grain dietary.

Many of the Indian fruits besides affording a grateful acid to the economy, are in themselves full of nutriment. The plantain, jack fruit, mangoe, custard apple, pine, and melon are all instances of wholesome and nutritious food. The fruit of the custard apple, which grows wild in the Hyderabad country, has in times of scarcity been the means of saving thousands of the population from starvation. The many uses of the cocoanut, the palmyra nut, date, &c., are so well known that they need scarcely be referred to here

2

except to observe that whenever these palms are common to the soil, they contribute in a very important degree to the food of the population.

Sugars and starches.

The sugars and starches, which abound in many portions of Southern India, play also a very prominent part in the diet of the people. Sugar is made not only from the cane, but from the inspissated juices of different varieties of palm. Sugar cane, in the districts where it grows, is eaten largely in a raw state. In the South of Tinnevelly, the *jaggery,* or impure sugar obtained by boiling down the toddy of the palmyra tree, forms a very important item of the staple food. The higher classes both of Hindoos and Mahomedans eat largely of " sweetmeats," many of them very curiously composed, but the chief bases of these compounds are sugar, butter, almonds, and flour.

Sweetmeats.

Arrowroot abounds on the Western Coast of the Madras Presidency, and in lower Bengal.

Increased culture of the potatoe in Mysore and Neilgherry hills.

In allusion to food of this description, the extended culture of the potatoe in the Mysore provinces, and on the Neilgherry plateau, should not be passed over without notice. At Bangalore these tubers are largely used by the native population, and appear to be much relished. On the hills too they are consumed by the natives, and form an article of considerable traffic to the low country.

Spices and condiments, their use as food.

Spices and condiments do not appear to have much nutrient value in themselves, although they form a very marked feature in all Indian dietaries. Without something to stimulate and excite the digestive organs, it seems probable that the vast amount of grain taken into the stomach every twenty-four hours could not be assimilated. The essential oils, or acrid resins, of the condiments of an Indian dietary, appear to have the effect of exciting a sufficient flow of gastric and salivary juices to soften the bulk of vegetable food, and thus help in its conversion into material fitted for the nutrition of the body.

Chillies, black pepper, coriander, cardamoms, turmeric, and ginger, are used by the grain feeding population of India in quantities which would astonish those who derive their sustenance from a less bulky but more nutritious diet. The natives of India, are unequalled in the preparation of " chatnies," compositions of fresh fruits or vegetables, with onions, garlic, chillies, &c., and these

Chatnies.

often take the place of pickles in giving a zest to food. With the variously prepared chatnies and spiced curries, the native gives to the most tasteless food a piquant and appetizing flavour.

Diet of the people not so simple as represented.

Such is a very brief account of the principal classes of substances used as solid food by the native population. It must be evident that with such a wide variety of animal and vegetable productions, the diet of the people is by no means so simple as has been represented.

The fruits of the earth are gathered in abundance, and but with little toil or labour. The varying climates of the several districts are marked by differences in the character of the vegetation. The food which is most plentiful in one district may be almost a foreign produce in another, but on the whole, Nature has been wonderfully bountiful in bestowing her gifts, and all districts are supplied with a great variety of substances useful for the nutrition of man and beast.

Malabar Coast supposed to be unsuited for domesticated animals.

The Malabar Coast has been alluded to by Dr. Cleveland as destitute in some degree of the requirements for supporting animal life, but the remark applies evidently to the difficulty experienced in the rearing of domesticated animals, such as the ox and sheep. The wild forests of the district are stocked with the larger animals, which are in no sense inferior to the animals of the same class on the other side of the ghaut. The prolific fisheries on this Coast however compensate in a wonderful degree for the scarcity of animal food in the provinces.

Drinks.

Drinks.

The most common drink of the people every where is plain water, but it is by no means the only fluid used to allay thirst. The water in which grain has been boiled is also generally drunk with meals either fresh or after standing for some hours and becoming acid by fermentation. "Pepper water," a kind of soup without meat, is another very common drink with meals; an infusion of ginger is not unfrequently used on the Western Coast.

Conjee water.

Pepper Water.

Increased local consumption of coffee and tea.

Of late years, tea and coffee have been more largely consumed by the native population. In the districts where coffee is grown, there is a very large local consumption of that article. Native road side coffee shops are often met with. The local demand for coffee in this Presidency is extending every year, and bids fair to increase.

A really pure and wholesome drinking water is by no means easy to procure in Southern India. The exceptions are to be found chiefly in the mountain ranges, where the supply is constantly welling up fresh and sweet from the hill-sides. The streams as they descend to the plains carry down much organic and alluvial matter in suspension, and the proportion of salts, from exposure to high temperature and rapid evaporation, increases as the waters approach the outlet to the sea. In many districts, the saline particles of the soil being dissolved, give a brackish and unpleasant taste to the water. Chlorides, and nitrates and sulphates of soluble salts often abound in undue proportion, while organic matter in the shape of minute animal and vegetable organisms are constantly present to an injurious extent. The use of impure water is probably one of the most common causes of the prevalence of malarious fevers, fluxes from the bowels, and guinea-worm, in the native population. In the town of Madras, which is supplied wholly from wells and tanks, there is a great difference in the amount of organic constituents in the well waters.

Drinking water in India generally impure.

Some I have ascertained by the simple test with the permanganate of potash to hold double or treble the amount of organic matter which is contained in the better kinds. In the Coimbatore and Salem districts, the waters are generally disagreeably impregnated with nitrates.

Fermented Drinks.

Fermented and distilled liquors.

As a rule the natives of Southern India are not given to excess in the use of fermented drinks.

With the wide-spread distribution of *toddy* yielding palms, it is but natural that the use of that beverage in a simple, and fermented condition should be very prevalent amongst the great majority of the population. Many drink the fresh toddy, others use it just as fermentation is beginning, or when it has attained considerable intoxicating power, while many again prefer to indulge, as their means permit, in libations of country spirit, (arrack) distilled from toddy or rice. With the strict professors of religious observances, whether of the Hindoo or Mahomedan faith, the use of fermented liquors is considered wrong, and if indulged in at all by these people, they are drunk in secret, but the millions of the population are not deterred by any such scruples. The Natives of hilly or mountainous districts in the interior are perhaps more addicted to spirit-drinking than the people of the plains. Drunkenness is a common vice amongst the Coorgs; and the Khonds and Bheels distil a fiery spirit from the flowers of the *bassia latifolia* which is drunk in large quantities by those people. So cheap is it, that for the moderate sum of half an anna, a man can procure enough to thoroughly intoxicate himself.

The use of palm juice very common.

The natives of the plains who have settled in the bazaars of our hill stations, drink freely of any fermented liquor they can get—of late years they have taken to *beer,* which is manufactured in a local brewery at Ootacamund. Drunkenness is very prevalent amongst the bazaar people and native servants at this station. In physical appearance and muscular power however the people seem to improve after they become accustomed to the change of climate. By all recent testimony the use of spirituous liquors is becoming more general in the interior of the country, and in the Presidency and coast towns where the intercourse with the people of foreign nations has been regular and constant, there can be no doubt that spirit drinking has become a common vice with some members of the rising generation of natives. The following table shows the quantities of foreign spirits and wines imported into Madras, and the revenue derived from the licence to sell spirituous liquors, and will help to indicate in what degree the consumption of intoxicating drinks has increased of late years. Of the foreign liquors it is gratifying to observe that the chief steady increase during the last five years has been in the importation of *beer,* the least injurious perhaps of any liquor when drunk to excess. Spirits have been imported in quantities larger than can well be accounted for by the increase of the European population subsequent to the mutiny in 1857.

Table shewing the quantity and value of Foreign Liquors imported into the Madras Presidency during the last 15 *years, arranged in quinquennial periods.*

		Quantity. Gallons.	Value.		
			RS.	A.	P.
From 1846-47 to 1850-51.	Wines.........	2,94,697	24,98,412	0	0
	Spirits.........	2,04,140	8,69,807	0	0
	Malt Liquors.	15,96,917	14,40,300	0	0
	Total.......	20,95,754	48,08,519	0	0
From 1851-52 to 1855-56.	Wines.........	2,86,444	26,81,405	0	0
	Spirits.........	1,94,650	7,67,613	0	0
	Malt Liquors.	27,95,400	19,35,384	0	0
	Total.......	32,76,494	53,84,402	0	0
From 1856-57 to 1860-61.	Wines.........	3,00,119	23,93,170	0	0
	Spirits.........	2,10,274	13,57,961	0	0
	Malt Liquors.	27,19,898	24,98,450	0	0
	Total.......	32,30,291	62,49,581	0	0

For the figures from which this table has been framed, I am indebted to the Collector of Sea Customs.

The Collector of Madras, in statement and letter appended, shows a steady increase in revenue under *abkarry* during the last ten years, and what occurs in this one collectorate, is going on more or less throughout India, as shown by the progressive increase of imperial revenue under this head.

The Honorable Mr. Ellis is probably right in saying that the individual consumption of spirits in the town of Madras has remained very much as it was some years ago, though from the general increase of abkarry revenue in the provinces, coupled with the enormous increase in the imports of foreign spirits, it is but too certain that the use of spirituous liquors is becoming more common amongst the native population. There is besides a large amount of collateral evidence to show that the European portion of the population do not drink the same large proportion of liquor they did fifteen or twenty years ago.

Statement shewing the amount of revenue under Abkarry for ten years, from July 1852 *to June* 1862, *Zillah Madras.*

	RS.	A.	P.
Fasli 1262	6,65,441	3	3
Do. 1263	6,55,442	9	5
Do. 1264	6,29,876	3	5
Do. 1265	6,68,676	10	5
Do. 1266	7,45,511	9	0
Do. 1267	8,55,042	14	2
Do. 1268	8,60,208	1	8
Do. 1269	9,84,313	7	1
Do. 1270	10,51,396	15	1
Do. 1271	9,78,878	5	3
Total.	80,94,787	14	9

N.B.—The Abkarry Revenue being reckoned from the 1st July to 30th June following, the Revenue is given fusliwar.

No. 168.

MADRAS COLLECTOR'S OFFICE,
SAIDAPET, *29th May* 1863.

From the HONORABLE R. S. ELLIS, C.B.,
Collector of Madras,

To W. R. CORNISH, ESQ.,
Secretary to the Principal Inspector General,
Medical Department.

SIR,

1. In reply to your letter of the 1st instant, I have the honor to forward a statement showing the abkarry collections during the last 10 fuslies commencing from fusly 1262 to fusly 1272.

2. The presence of the Railway has during the last few years increased the Abkarry Revenue not only since the line was actually opened in 1856, but also while the line was forming and while Stations and Workshops were under construction. The movement of Troops during and immediately after the Mutiny also caused an increase to the Revenue.

3. I do not however think that in Madras the increase of Revenue has been attended by increase of drunkenness or by its usual concomitant crimes of violence. I would rather attribute this increase in Revenue to a greater concentration of the consumers of spirits and to a more careful supervision of the Abkarry department, by which smuggling has been decreased. The native population has as regards the individual consumption of spirits remained very much "in statu quo" for the last few years.

OTHER INTOXICANTS.

It seems almost a necessity of his nature that man should indulge in the use of some form of nervine stimulant.

Stimulants of universal use.

Wherever the human race exists, even in the most primitive and uncivilized condition, the art of producing intoxicants is known and practised in some form, however rude and barbarous. In India, a country boasting of an ancient civilization, the use of nervine stimulants has been coeval with its history. Opium, Indian hemp, and the betel nut of the areca palm, have been used by the people from time immemorial, and in more recent years the tobacco plant, has been cultivated throughout the length and breadth of the land. If the

people generally take a less quantity of fermented drinks than those in temperate zones, they certainly make up for the omission by the habitual use of opium, hemp, betel, and tobacco.

Effect of stimulants upon health.

The effects of these articles in moderation, is probably rather beneficial than otherwise. Opium eating and *gunjah* smoking are both occasionally carried to excess, and the consequences, in injury to the nervous tissues of the body, are very similar to those resulting from the excessive use of ardent spirits. The moderate use of all these agents appears to prevent undue waste of tissue in the body, and to render the frame less susceptible to the action of those impalpable but pestiferous poisons which are so prevalent in the soil and atmosphere of tropical countries. The craving for the use of these things undoubtedly arises out of some urgent necessity in man's nature.

If one particular form of stimulant falls into desuetude, it is replaced by another. Years ago, when drunkenness was the prevailing vice of even the upper ranks in England, tobacco smoking was thought to be low and vulgar, but as the habit of drinking to excess fell into disrepute, so did the use of tobacco become more popular, until in the present day the proportion of men who use tobacco in some form probably very greatly exceeds the number of those who do not. Excess in the use of tobacco is not only less hazardous to life, but is also much less frequent than the abuse of alcoholic stimulants, and the change therefore from alcohol to tobacco, as a national stimulant and sedative, is to be regarded as an advance in the right direction. It has been stated on good authority that in English towns where the "total abstinence" movement has been largely followed by the labouring classes, there has been a corresponding increase in the sale of opium. It is not very long since, that one of the leading apostles of teatotalism was openly accused by a rival of indulging in the practice of opium eating ; whether the charge in that particular instance were true or not, there is no question but that there is an innate craving in the human constitution for something which has the effect of calming and soothing the nervous centres. These portions of the human frame are more and more called upon for exertion in the countries where civilization is progressing with giant strides, and it does not seem very probable that the views of those enthusiasts who decry the use of intoxicants are likely to have any sensible effect upon the future conduct of the human race.

It would be well perhaps if reformers would content themselves with teaching and practising temperance, seeking to prove the wisdom of using

all God's good gifts instead of abusing them ; more good would be done in this way than by wasting their energies in attempting to show that Nature is a fool, and the craving for nervine stimulants merely the promptings of an evil Fiend.

The appetite for stimulants, as a late writer* has truly observed, is one " which like the other faculties is given to different men in different " proportions, and is subject like them to the organic laws. It grows with " use, and lessens with disuse. It can be inherited and transmitted. Mode- " rately indulged in, it is sanatorily and socially a blessing ; immoderately, it " becomes a curse to its victim, and a social pest."

Some authorities have attempted to trace a connection between the food of a nation and the national appetite for stimulants. It has been asserted that in countries where the *starchy* food predominates, the craving for stimulants is in excess, and the instances of the Scotch who live on oatmeal, and the Irish on potatoes have been adduced to account for the national predilection of those people for whiskey. So too it may be noted that the blubber-eating people of the arctic seas have no relish for alcohol, and the general testimony of arctic voyagers that alcoholic stimulants are positively hurtful in those regions, whereas the appetite for *hydrocarbons* in the shape of *fat* and *oil* is wonderfully increased.

In India, where the starchy foods predominate, the national love of stimulants is exemplified rather in the universal consumption of betel, tobacco, opium, and hemp, than in a general proclivity towards the use of fermented drinks.

II. The Philosophy of Food.

Before proceeding to consider the effects of different articles of food on the physical and mental condition of the native population, it may be as well to state briefly what food is, and what we know regarding its uses in the animal economy. A consideration of this subject is necessary to make clear the subsequent observations on the insufficiency of prison dietaries in the Madras Presidency.

Chemistry of food.

All substances used as food are resolvable into the four elements, carbon, hydrogen, oxygen, and nitrogen, in combination with certain mineral ingredients.

* Dr. R. Bird, Indian Annals, No. 16, page 498.

Whether the food be derived from the animal or vegetable kingdom does not matter in the least, so long as it contains these elementary substances in due proportion. The ultimate elements and the proximate principles of food are nearly alike in both the animal and vegetable kingdoms. If we have albumen and fibrine in a leg of mutton, and casein in cheese, we find almost exactly the same substances in the cereal grains, and in peas, beans, and lentils. The proximate chemical principles required for the nutriment and development of man are—

Proximate principles.

the albuminous, the saccharine or starchy, the fatty, and the mineral. No food is complete which does not include a proper proportion of all these. The albuminous principles are

Albuminous matter.

found in both the animal and vegetable kingdoms. They are composed of carbon, hydrogen, oxygen, and nitrogen, in combination with phosphorus or sulphur. It is to these albuminous principles that we look for the material to build up and repair the waste of muscle, sinew, and nerve. They are also termed *nitrogenous* or azotised, in contradistinction to the class of food which is destitute of nitrogen, and therefore incapable of conversion into flesh.

Carboniferous or non-nitrogenised food.

The *non-nitrogenous* principles however enter very largely into all composite foods, whether vegetable or animal. They include starches, gums, sugars, fats, oils, vegetable acids, and probably alcohol, and the purpose they serve in the animal economy is to afford fuel, as it were, for the production of animal heat, by their union with the oxygen of the atmosphere during the process of respiration. It is highly probable that all *non-nitrogenous* food which is assimilated is converted by the mysterious chemistry of the body into fat before it is used in the production of animal heat, and as a supporter of respiration.

Consequences of an excess of non-nitrogenised food.

If these principles of food are eaten in excess, and the respiration is not proportionately increased by active exercise, solid fat is formed in excess and laid up in the tissues. The use of fats and oils in food tends to produce obesity. Brahmins and wealthy Hindoos who eat largely of *ghee* and take but little exercise are familiar examples of the fact just noticed. The mineral substances which are neces-

Mineral constituents of food.

sary to the body are various, but the most important of them are salts of lime, sodium, potassium and iron. All food must contain the three great principles, the nitrogenous, the fatty or starchy, and the mineral, and water as a diluent. Experiment has proved that, if either be absent, life cannot long exist.

Quantity of food necessary for support of the body.

The amount of food required for the sustenance of the body depends upon several surrounding conditions, and especially upon climate, and the amount of physical exertion which the individual undergoes. In northern latitudes where the temperature is low and the atmosphere dense, large quantities of what is called respiratory food (the fatty or starchy principles) are required to supply the waste occasioned by breathing an increased supply of oxygen.

Influence of climate and exercise.

In tropical countries, where the air is heated and rarefied, and where each inhalation contains a diminished supply of oxygen, less food is required. So the man who undergoes severe bodily exercise in the open air, has his respiration increased, and takes into his system more oxygen than one who sits all day at a desk, and whose breathing is never hurried. The former will require more food than the latter, for the reason that the waste and molecular changes in his various organs, go on with greater rapidity while he is working hard. The actual growth and increase of muscle by constant use and exercise may be witnessed often enough in the arm of the blacksmith, or the developed calf of the mountaineer. This growth and increase however takes place not by the laying on of fresh tissues upon the old, but by the rapid disintegration of old and worn out particles, and the substitution of new material for that which is effete. Every muscle of the body, to reach its highest state of development must be brought into daily use, so that its worn out particles may be disintegrated, and its place supplied by new material replete with force and vigour.

Mental work exhaustive, and requiring nourishing food to replace waste of cerebral tissue.

Severe mental application induces waste of cerebral and of nervous tissues, and those who work hard with their brains require a large supply of nourishing albuminous food, rich in phosphates, to maintain their mental vigour, equally with those who engage in pursuits which demand mere bodily exertion.

Hard labor requires about 35 ounces of solid food per diem.

It has been calculated that a laborer who engages in active bodily exercise requires at the least 35 ounces of dry nutritious food per diem, and that soundness of health cannot be kept up for any length of time under thirty ounces. This in fact is the smallest modicum of solid food which can be given to a prisoner condemned to hard labor.

Under trial prisoners, or persons who take no active exercise may subsist upon less.

In addition to the solid food, a considerable quantity of fluid is required as a diluent ; whether this is taken in the form of succulent fruits and vegetables, or as pure water, milk, tea, coffee, &c., it is calculated that the quantity of mixed solid and fluid food required daily is about seven pounds, and that *five* of these will be water. Within the tropics, these proportions may be slightly varied, but from the information now collected with regard to the quantity of solid food, a labouring man will eat when he has the chance, it seems probable that the allowance of 35 ounces is rather below the mark. To estimate the amount of food, which the body consumes, the excretions of healthy men have been repeatedly examined, and the following *résumé* of the subject by Professor Bennett* gives the latest and most accurate observations we possess :—

Of mixed solid and fluid, about seven pounds daily required.

Professor Bennett's estimate of the daily amount of excreta from a healthy man.

" Of carbonic acid there are given off about two pounds, or seven cubic " feet, of which an ounce and a half may be separated by the skin; of water " there is about six pounds separated, one-half by the urine and fæces, and " the other half by the lungs and skin. The urine contains ten times as " much as the fæces, and the skin gives off twice as much as the lungs, or " somewhat more.

" As it is calculated that only five pounds pass into the body mixed with " the food, the extra pound is supposed to be formed in the system by the " union of oxygen with hydrogen in the proportion to form water. Of urea " an ounce is separated daily in the urine of an adult man, together with " eight or ten grains of uric acid. It is by these substances which contain " about fifty per cent. of nitrogen that the azote which enters the body is " almost altogether separated from it. The earthy salts pass out in minute " quantity dissolved in the sweat, and are given off more largely by the " urine, which contains daily four drams and a half of chloride of sodium, " four drams of sulphate soda and potash, two drams of acid phosphate of " soda, and one dram of phosphate of lime and magnesia. In the fæces, " another four or six drams of mineral matter may be passed daily, the chief " portion of which is derived from the residue of the food. Besides the

* Dr. J. H. Bennett's Lecture on Molecular Physiology, Pathology, and Therapeutics, and their application to the treatment of disease.—*Lancet*, March 7th, 1863.

"substances named, a certain quantity of fatty, coloring, extractive, and other "matters is excreted, the amount of which has not been yet estimated."*

We thus see from the daily waste of the body, that all the kinds of food, the albuminous, the carboniferous, and the inorganic salts, are consumed and used up at a rapid rate. If the quantity of food, or the proportions of the three great classes be insufficient to compensate for this normal waste and disintegration of tissue, then disease and death speedily ensue.

Differences in the albumen, fibrine, and casein of animals and vegetables not yet explained by chemists.

Although chemists can find no appreciable difference in the constitution of albumen, fibrine, and casein of animal or vegetable tissue, yet it is certain that there are some differences which at present are beyond their power to explain.

Milk the type of a perfect food.

As Professor Bennett truly remarks, it has not been explained to us why the *carnivora* reject vegetable and the *graminivora* refuse animal food, or why the substances which contain the least nutritious matter for one class of creatures are the chief means of support for others. The lion and tiger live only on the flesh of their prey, but the domesticated dog and cat will eat and assimilate nutriment from vegetable as well as animal food. Man, however, above all other creatures, has the faculty of deriving his food and nutriment both from the animal and vegetable kingdoms. In infancy, he finds his nourishment in Nature's simplest and most perfect type of food, milk, which contains in due proportions every principle necessary to the growth and development of the human body. But as the child developes in strength, and begins to shift for himself, his diet is adapted to the conditions of life which surround him. In the arctic regions, where vegetation is scanty, he feeds principally upon animal fare. The fat and blubber of the seal or walrus supply the place of the starch and sugar of the vegetable world. In the tropics, where the fruits of the earth are brought forth in abundance, the staple food is derived from the vegetable kingdom. In the temperate regions, where the balance between animal and vegetable life is more equally maintained, both kingdoms contribute pretty equally to furnish a variety and profusion of food.

The whole tenor of the reports of district Medical officers now submitted, goes to show that the diet of the Indian population is not of that simple character which has been usually supposed. There is as great a

* Bennett, Op. Cit.

variety in the diet of the Indian labourer as of the industrious poor in other countries, and the craving for change and variety is as intuitive a faculty of Man within the zones of the tropics as in temperate climes. In concluding this part of the subject, I cannot do better than quote the eloquent words of a writer in the *Cornhill Magazine,** expressing what our requirements are in the way of food :—

" Food must contain not material only, but power ; that from which life " is to flow must embody the results of living action. It must be redolent " of sunshine, and permeated with light ; it must have drunk in the virtues " of the air of heaven. For all these, our food must transfer to us, to glow " within our veins, and animate our nerves. Through it, the forces of the " universe must work within us, in order that we may live ; and therefore " surely it is not to one or two, or twenty varieties of food, does nature " stint our appetite or confine our feasts. She opens her hand, and pours " forth to man the treasures of every land and every sea, because she would " give to him a wide and glorious life participant of all variety. For him " the corn fields wave their golden grain of delicate wheat, or hardier rye, of " strengthening oat, or thinner rice, or oil abounding maize. Freely for him " the palm, the date, the banana, the bread-fruit tree, the pine, spread out " a harvest in the air, and pleasant apple, plum, or peach solicit his ready " hand. Beneath his foot lie stored the starch of the potatoe, the gluten " of the turnip, the sugar of the beet, while all the intermediate space is " rich with juicy herbs.

" Nature bids him eat and be merry, adding to his feast the solid flesh " of birds and beast and fish, prepared as victims for the sacrifice ; firm " muscle to make strong the arm of toil in the industrious temperate zone ; " and massive ribs of fat to kindle inward fires for the sad dwellers under " arctic skies."

III. Dietaries of the labouring poor and prisoners contrasted.

In the following table, I have set down the nature of the food of the free population and of prisoners in Jail in the several districts, and I have further shown the average sickness and mortality of the prisoners for a period of seventeen years ending 1860-61.

---

* Food—What it is.—*Cornhill Magazine,* vol. III., page 472.

Name of Zillah or Jail.	Nature of the Staple food of free population. — Principal Cereal Grains.	Average quantity per diem.	Other Food.	Ordinary Jail Diet and quantity of grain for hard labor prisoners. — Principal Cereal Grains.	Average quantity. per diem.	Other Food.	Per Centage of — Admissions to strength in Jails.	Deaths to average strength.	Deaths to aggregate strength.
Bellary	Cholum, Raggy, Cumboo (not much used), Rice by Brahmins.	oz. 33	Mutton, Fish, Ghee, Vegetables, Fruit Milk, and Sugar.	Cholum................ or Cumboo, Raggy...	oz. 28 24	A money allowance daily for condiments, dholl and meat of 4 pice.	51·2	3·3	1·7
Calicut.........	Rice..........	24 to 36	Do.	Rice.......................	26	Do. 4 pice.	180·2	10·6	5·4
Cannanore....	Rice..........................	32 to 40	Do.	Rice.....................	26	Do. 3½ pice.	200·1	2·7	2·03
Chittoor... ...	Raggy for poor people, Rice for the rich, or both combined.	Not known.	Do.	Raggy.................... Rice...	14 8	Do. 4 pice.	94·2	3·9	2·6
Chingleput....	Rice 40 varieties, Raggy, Cumboo.	Not known.	Do.	Rice...........	26¼	Do.	131·9	3·3	1·7
Chicacole	Rice, Cholum, Raggy: Rice preferred by the better classes, the cheaper grains used by the poor.	Not known.	Do.	Rice.....................	28	Do. 3½ pice.	56·1	4·8	2·3
Cochin....... .	Rice.....................	Not known.	Do.	Rice......................	28		157·1	4·7	2·3
Combaconum.	Rice, Cholum, Cumboo, Veeragoo.	24	Do.	Rice......................	26	Do. 3½ pice. Mutton 4 oz. Ghee ½ oz. Thrice a week.	231·6	10·8	3·4
Cuddalore. ..	Raggy, Cumboo, Tennay, Rice...	32	Do.	Dry Grains......... .. or Rice....................	24 26	Do. 4 pice. and meat once a week	97·7	5·5	2·8
Cuddapah....	Cholum, Raggy, Italian Millets. Rice a luxury.	48	Do.	Cholum...	30	Do. 3½ pice. Mutton once a week 4 oz.	145·7	6·9	3·1

Name of Zillah or Jail.	Nature of the Staple food of free population. — Principal Cereal Grains.	Average quantity per diem.	Other food.	Ordinary Jail Diet and quantity of grain for hard labor prisoners. — Principal Cereal Grains.	Average quantity per diem.	Other Food.	Per centage of — Admissions to strength in Jails.	Deaths to average strength.	Deaths to aggregate strength.
		oz.			oz.				
Coimbatore ...	Cholum, Raggy, Cumboo ; Rice for the rich.	24 to 40	Mutton, Fish Ghee, Vegetables Fruits, Milk and Sugar.	Cholum, ...	24	Dholl 1½ oz. Mutton, thrice a week 5 oz.	89·05	11·4	3·3
Guntoor.........	Cholum	Not known.	Do.	Cholum...... ... . Rice, once a week ...	28	4 pice.	67·06	1·8	1·1
Honore.........	Rice along Coast... ... . Dry Grains in the interior.	32 to 48	Do.	Rice	26	Do. 4 pice.	126·3	3·08	1·5
Madras...... ..	Rice...... . ... Dry Grains. Wheat flour.........	24 32 to 48	Do. Do.	Rice......................	24	Do. Mutton or Fish 2 oz.			
Kurnool	Cholum, Rice	Not known.	Do.	Cholum.................. Rice at discretion of Medical Officer.		4 pice.	107·9	6·2	2·7
Madura...... ...	Raggy, Rice, Cumboo, Cholum, Millets.	Not known.	Do.	Rice 5 days .... Raggy 2 days.........	28 24	Do. 4 pice.	177·3	13·02	4·8
Mangalore	Rice......................................	Not known.	Do.	Rice..	28	Do.	137·2	7·8	3·6
Masulipatam .	Rice.................................. .. Raggy, Cholum and Cumboo for the poor.	32	Do.	Rice....................	22	Fish 2 oz. Do. 5 pice.	57·7	3·5	2·1
Nellore.	Cholum, Raggy, Rice...	48 to 64	Do.	Rice......................	28		52·8	5·3	2·2
Ootacamund 5 Years...	Raggy, Millets, Rice.......	24	Do.	Rice.........	24	Milk and Ghee, every second day. Do.	303·8	2·8	1·07
Paumbem	Raggy, Cholum, Rice, Cumboo.	28 to 32	Do.	Raggy, Cumboo......	24	Dholl 3¼ oz. Mutton, Weekly 10 oz. Do. Saltfish 2½ oz.			

Rajahmundry.	Rice	Not known.	Do.	Rice	28	Do.	4 pice.	181·4	6·06	2·7
Salem	Rice by the wealthy, Raggy and Cumboo by the poor.	Not known	Do.	Raggy and Rice		Do.		174·9	19·9	6·4
Tranquebar	Rice on the Coast	24	Do.	Rice	26	Do.		249·7	4·9	2·1
	Dry grains in interior	33	Do.							
Tellicherry.	Rice	Not known.	Do.	Rice	26	Do.	3½ pice.	96·02	3·7	2·1
Tinnevelly.	Cumboo	44	Do.	Cumboo	24	Do.	3¼ pice.	74·7	4·4	2·4
	Raggy	74	Do.							
	Cholum, Tennay, Rice.									
Trichinopoly.	Rice, Cholum	Not known.	Do.	Rice	26	Do.	3½ pice.	84·5	5·8	3·5
Vizagapatam.	Cholum, Raggy and Cumboo	32	Do.	Rice.	26	Do.	3½ pice.	109·3	3·4	2·2
Vellore.	Rice Raggy, Cholum, Cumboo	32	Do.	Raggy	14	Do.	4 pice.			
		61		Rice	8					

Average quantity of food consumed by free population in excess of that of prisoners.

With regard to the exact quantity of food consumed by the labouring population, the reports from several of the zillah Surgeons are by no means explicit. There is however a remarkable general testimony, when the quantities are mentioned, to show that the bulk of food consumed by an ordinary well-to-do native, is much in excess of that considered necessary for a prisoner condemned to hard labour. A free labourer if he has the means will use from thirty-two to forty ounces of (cereal) grain, (cholum, raggy, cumboo, or rice) about two or three ounces of dholl, a similar quantity of meat or fish, and fruits or vegetables, in addition. The average bulk of solid food, may be from 45 to 60 ounces per diem, whereas the maximum allowance of grain to a prisoner in jail is *twenty-eight* ounces, and in many jails not more than *twenty-four,* while the proportion and variety of meat, dholl, curry stuff, vegetables, fruits, &c., is very much below the standard consumption of the free population.

The rations of the Madras Sepoy on foreign service include *thirty two ounces* of rice. It is the chief article of his diet in Burmah, where there is scarcely any animal food which the rules of caste will permit him to eat. It is said however that the quantity is more than a man can eat, especially when the food is cooked in messes. A portion of the ration is often sold by Sepoys. It must be remembered that the duties of a native soldier in garrison

are not of a nature to entail hard labour, and that less food is needed by Sepoys under such circumstances than by ordinary cooly labourers.

The deficiency of animal food in the diet, and the excess of carboniferous material, is undoubtedly a fertile source of the excess of sickness in native Troops on foreign service.

The proportion of carboniferous to nitrogenous material in the rations of the Sepoy is as *eight* to *one*, and the dietary is even worse adapted to preserve health, than the scale laid down for prisoners in jail. From numerous personal inquiries, I should be inclined to reckon the average consumption of cereal grain per diem of an adult labouring man, as rather under than above 30 ounces.

The greater variety of food, and its more liberal use by the free population depends very much upon the means of the individuals, as well as upon the supply of food in the district. In times of famine and drought, after repeated failure of the crops for want of rain, the quantities of grain given as the probable daily consumption of a healthy man would be very much reduced, and at such times the jail diet would be superior to that of the greater number of the labouring poor. This is still too often the case. In years of scarcity, grain robberies and petty thefts are very prevalent, and many of these offences are committed with the express object of securing the jail rations as a remedy against starvation. At such times the want of due nourishment is painfully evident in the attenuated bodies of the poor. Many die from the immediate effects of starvation, while the great bulk of those who live to struggle against famine, have the vital powers so reduced that they are predisposed to suffer from the ravages of cholera, and typhus fever. The connection between famine and pestilence, the following of the latter in the wake of the former, has received many a practical illustration in the records of Indian history within the present century.

What has been said, therefore, with regard to the greater amount of food of the free population, refers rather to their capacity for eating, than to actual consumption, the latter being regulated in great measure by the means of the people, and the cheapness of the food.

Nature however is not often at fault in these matters, and if a man's stomach tells him that it can receive and digest two or three pounds of grain in twenty-four hours, those quantities are probably necessary to support the health and strength of the individual. The hard labouring man in temperate

climates, can get through his work best on bread and meat, and beer, and the greater his bodily exertion, the more he requires of nourishing food.

The Indian labourer acts much upon the same principle. The harder he works the better he lives. The good living is a necessity of the hard work. One could not be kept up without the other. Instead of feeding upon rice, like the Brahmins and Chetties who take no active exercise, he depends upon the more nutritious raggy, cholum, or cumboo, for the staple of his food. The testimony to this fact is most complete, and the revelations of science with regard to the unsuitability of rice, as a supporter of strength for those who have to live by the sweat of their brow, are strikingly confirmed by the practical experience of the labouring classes in India. Thus the zillah Surgeon of Salem (Assistant Surgeon Crocker, M. D.) remarks :—"The physical condition of those who live on raggy, the highly developed state "of the muscular system especially, the entire absence of all skin affections, "the positive aptitude for any amount of arduous labour, are, in my opinion, "convincing proof of its utility and highly nutritious qualities."

The Indian labourer obliged to resort to the more nutritive of the cereals in preference to rice.

And again with reference to another of the millets, *cumboo*, Dr. Wilson of Madura remarks :—"There are people living in the south eastern portion "of the district called Reddies who use this grain, almost exclusively for "food, and they are remarkable as being a tall, robust, muscular race. They "are an agricultural people; some I have measured in the Civil Hospital and "found to be six feet in height, and stout in proportion. They are not large "eaters of animal food."

The Medical Officer of the Paumben jail notices that the living upon rice diet, necessitates an expenditure for either animal or vegetable food containing more nutriment, and he states that "the nutritive qualities of the "coarser grains (raggy particularly) are so much appreciated that even the "wealthy people often partake of them."

Dr. Busteed, the zillah Surgeon of Combaconum remarks, "that the classes whose food is of the coarsest description (raggy, or cumboo) are the most hardy, and capable of enduring great fatigue."

Dr. Fletcher of Cuddapah remarks of *cholum*, the staple food grain of the district :—"It is a very wholesome and nutritious grain, and is much eaten "by those who require to work hard and endure much fatigue, *in preference*

"*even to rice.*" Other instances may be brought forward, but enough has been said to show that rice is not the chief food of the poor and working man.

The reports however bear almost unique testimony to another fact, and that is, the almost universal preference given to rice, by those whose means will allow them to purchase it. Why this should be is strange, and not at all easy of explanation at a first glance. Raggy, cumboo, and cholum, not only contain nearly double the amount of flesh-forming ingredients, in a given weight, but they are twice as cheap as rice, and occasionally three or four times the weight of dry grains may be had for the price of a measure of rice.* Poverty and the necessities of labour cause the poor to feed on the food best suited to their condition: wheat flour in the North of India, the millets in Southern India; but in the south, at least, the labouring man sighs for the rice and ghee of the rich "Chetty" or "Brahmin," and estimates it as the perfection of diet, though beyond his reach, much in the same way as the bumpkins of rural England, are apt to regard the turtle and venison of city magnates.

The true explanation probably may be found in the fact that rice has been the staple food of the Hindoos, ever since they have had a history, and especially of the higher castes, who had no need to labour for their daily wants. To such a people, rice, aided by the milk and butter, and curds, and sweetmeats and vegetables of their daily diet, was not an unsuitable food. The fact of its being so highly estimated by the Brahmins and higher classes was sure to make it desired, and sought after by the lower orders. Brahminical superstition in the estimation of the value of the several articles of food, was certain to influence the feelings of those lower in the social scale; hence we probably have a partial explanation of the curious fact, that rice is the most popular food grain, though it be the least nutritious. So long as rice is the grain 'par excellence' of the rich, the dainty, and luxurious, it will be useless to expect that the common, but really more valuable cereals will take their proper place in popular estimation. Even in civilized countries it is not uncom-

---

* In the *Fort Saint George Gazette of 8th May* 1863 is given a comparative statement by the Revenue Board of the cost of the various grains in each district. In the month of March 1863, the prices ranged as follows :—

Rice, 2nd quality,	from	Rs.	215 to	Rs. 422	per garce.
Cholum	,,	,,	129 to	274	,,
Raggy	,,	,,	107 to	221	,,
Horse gram	,,	,,	115 to	276	,,

Rice was cheapest in Ganjam and dearest in Cuddapah; Cholum cheapest in Tanjore, and dearest in the neighbouring district of Tinnevelly; Raggy cheapest in Tanjore, and dearest in Madras; Horse gram cheapest in Ganjam and dearest in Malabar. The enormous difference in prices within the Madras Presidency, even in contiguous districts, is not a little remarkab' .

mon to find a fictitious value attached by the vulgar to certain articles of diet, amongst which may be mentioned "arrowroot," and "jelly," as "strengthening" food for invalids. In some sea-side places, the fishing population esteem the product of their labours but lowly, and will rarely eat fish so long as they can get beef or mutton. During the progress of the Irish famine, an attempt was made to substitute the meal of Indian corn, as a nutritious substitute for the potatoe, but the prejudice was so strong against it, that to this day, it is but little used in Great Britain and Ireland.

Rice seems to be preferred by the people of India, because it is used by their priests and aristocracy, certainly not on account of its intrinsic value as an article of food. The Chinese, Japanese and Burmese grow rice just as commonly as the Hindoos, but the animal diet they consume along with it, prevents the evil consequences which result from a too great dependence upon this grain, as the staple food of a nation.

If rice be so unsuited as the principal food of a people, the evidence in corroboration of the fact ought to be found in the effects of those prison dietaries which have that grain for their foundation, and there is no doubt that the ratios of sickness and mortality in jails, where rice is the principal food, will be found higher as a rule than in prisons where dry grains are chiefly used. The jails of the Punjaub and North West Provinces, where the prisoners live upon wheat flour, have a lower rate of mortality than those in Bengal where rice is the staple grain. The Burmese jails, where rice is the chief food, are notorious for their high average mortality. Unfortunately, however, the disturbing elements in the Madras Presidency are so considerable, that the actual jail returns do not show the fact of increased mortality in rice eaters at all clearly. In the following table is given the sickness and mortality of twenty-six jails, for a series of years. In nine of these jails the principal food has been dry grains; in seventeen rice.

	Admission to strength.	Deaths to strength.	Deaths to aggregate strength.
Jails with dry grain food.........	100·26	7·0	2·9
Do. with rice....	140·70	5·6	2·6

This simple table shows, that the proportion of sickness has been least in the dry grain jails, but the mortality has been higher.

The excess of deaths, however, is explainable on other grounds than the nature of the food. The "dry" grain jails include the notoriously insalubri-

ous buildings at Salem* and Coimbatore, two of the worst in the whole Presidency, in which the average mortality, chiefly from defective accommodation, ventilation, &c., was 19·9 and 11·4 per cent. respectively. To prove that the excessive mortality in these jails arose from causes unconnected with food, it is only necessary to refer to the fact that when the prisoners were moved out of the old Salem jail into the new building, they became fairly healthy, and would no doubt have continued so, if the new jail had not been in its turn, made to accommodate four times the number of prisoners for which it was intended. If the mortality in these two jails, due to sanitary defects in the buildings, could be subtracted, the contrast between the effects of dry grains and rice diet would be very marked. The healthiest jail in the whole Presidency is at Guntoor, where the prisoners subsist on cholum. They are not over-crowded, and the ventilation and site of the building according to Mr. Rhode are good, but the sickness is very slight, and the average mortality only 1·8 per cent., a ratio probably lower than what obtains among the free population of the town and district. It is to be regretted that the insalubrity of so many of the jail buildings should be so marked, as to disturb all calculations of this nature, otherwise the figures of the table might have been appealed to in evidence of the undoubtedly superior nourishing powers of the dry grains over rice.

Guntoor the healthiest jail. Dry grain diet used there.

The testimony of Medical Officers as to the insufficiency of rice as an article of diet may be here alluded to. Mr. A. M. Ross says of the rice feeding people of the Western Coast:—"The Brahmins have no bodily strength, they never attempt "any muscular exertion, leaving that entirely to the lower classes; they are "very apathetic, they fall readily before disease, and are subject more than "others to the diseases of insufficient nutrition. The standard of age is "low." The Civil Surgeon at Mangalore observes also, "the prisoners are "incapable of long and continued exertion." At Masulipatam, the use of rice as the chief food of prisoners has been mentioned as a probable excitant of the disease *beri-beri*, which seems to be peculiar to rice eaters. The Madras Sepoys in Burmah, whose rations consist of rice, a little dholl, and ghee, with condiments, suffered a great deal from it in the late occupation of the Province. The Rajpoots of the Bengal Native army serving in Bur-

Bad effects of a rice diet.

Disease *beri-beri* peculiar to rice-eaters.

* I allude here to the old Salem Jail, the mortality in which is included in these statistics.

mah who lived upon *atah* (wheat flour) were not affected. Nor is the disease common amongst the Burmese who eat largely of animal food, fish, pork, &c. in addition to the rice which grows so plentifully in their country.

At Nellore, the Medical Officer reports that the inhabitants of the hilly tracts who live upon dry grains are "hard working" and that the Banians, Brahmins, &c. who live upon a rice diet, are "notoriously sedentary in their habits." In Rajahmundry, the Brahmin (rice-eating) class are said to be more subject to beri-beri than others. This peculiar disease is very common in the district where rice is largely grown, and the proportion of land under wet cultivation is yearly increasing.

The Medical Officer of Salem states, "Rice is not so well adapted for "the requirements of nature as raggy." "In the district of Tinnevelly, Dr. "Gillies reports the liking for cumboo grain (amongst the labouring popu-"lation of the interior) is so great, that were any to offer a labourer rice, he "would at once express his preference for the cumboo, asserting it to be the "most satisfying."

Dr. Dorward observes of the rice-eating people of Trichinopoly :—"They "are not so fine a race physically as those men who eat wheat or raggy."

At Vizagapatam jail, where the prisoners enjoy a rice diet, the Medical Officer observes : "They suffer much from diarrhœa, dysentery, and the "ænemic condition commonly called beri-beri, and any epidemic visiting the "district falls with great severity upon them."

Dr. Rennick in noticing that Vellore is a healthy place of residence for Natives observes : "The five kinds of cereals in general use are cheap, with the "exception of rice which has risen in price this season—animal food, chiefly "mutton, is abundant and moderately priced. Good, cheap, and varied "vegetable and animal food, must here, as elsewhere conduce to health and "prolonging of life." The last observation is undoubtedly correct. It is the *variety of food*, both animal and vegetable, which conduces most to health and longevity.

Variety of animal and vegetable food essential to health.

To understand more clearly the reason why rice in itself, although the most popular food of all the Indian cereals, is unfitted to sustain the strength of the labourer, it is necessary to give a brief table in illustration of the comparative, nutritive value of the Indian grains. For the analysis of raggy, cumboo, and cholum, I am indebted to the table given by Professor J. E. Mayer in Vol. II of the *Madras Medical Reports*, published in 1855.

Table of the composition of some articles of food in 100 parts.

	Quantity of nitrogenous or flesh-forming ingredients.	Quantity of non-nitrogenous or respiratory food.	Quantity of mineral ingredients.
Butcher meat, free from bone...	23·30	14·30	·50
Butter, fat, &c...	0·00	100·00	0·00
Peas (dholl)...	23·40	60·00	2·50
Lentils...	28·22	40·08	0 00
Wheat flour...	17·00	66·00	0·70
Raggy.	18·12	80·25	1·03
Cholum...	15·53	83·67	1·26
Cumboo	13·92	83·27	·73
Rice...	9·08	89·08	0·42
Potatoes......	2·40	22·80	1·00
Cabbage...	1·75	4·05	2·70

The nutritive value given by Mr. Mayer for rice is higher than that of most other chemists who have analysed it. Mr. Balfour (Cyclopædia of India, page 856) quoting from an English Work gives only 5·43 per cent. as the proportion of albuminous matter, while Pereira (Materia Medica, Vol. I, page 65) gives 7·40 as the proportion obtained from rice in the Giessen (Leibigs) laboratory. It is abundantly clear however, why the dry Indian cereals are better fitted for those who have to endure hard labor. They contain a large proportion of those nitrogenous compounds, in which rice is deficient. The nutritive value of rice perhaps varies a little, according to the species of the plant, and the locality in which it is grown; but under any circumstances, it is not equivalent to an equal weight of raggy or cholum as a supporter of life.

Rice deficient in flesh-forming materials.

Mr. Mayer has so clearly explained its place in the Dietary Scale, that it seems only right to quote his very words. "Though rice holds the lowest place when taken "as the only food of an animal; yet if it should form only a part of that food "and the remainder consist of meat, eggs, or other albuminous matter, in "such proportion that besides the amount of non-nitrogenous substances, "the whole food contains a sufficient proportion of albuminous or nitrogenous "matter, rice may be as useful as any other grain, it is only when viewed as "the *sole food* of an animal that it will hold the lowest place as an article of "nourishment."

Mr. Mayer's opinion of rice.

In contrasting the food of the free population, with that of prisoners in the Madras Presidency, we shall find some remarkable variations, especially in regard to the proportion of flesh-forming ingredients.

Dr. Christison on the proper proportions which should exist between the carboniferous and nitrogenous ingredients of food.

Dr. Christison* who for many years past has investigated the subject of prison Dietaries in relation to health, has thus stated his views :—

" Experience has shown that the most successful Dietaries for bodies of " men, deduced from practical observation, contain carboniferous and nitro- " genous food in the proportion of about three of the former to one of the " latter by weight. During two and twenty years that my attention has been " turned to the present subject, not a single exception has occurred to me."

Hence it is obvious that the least weight of food in the rough state will be required—first, when there is least moisture and cellular tissue in it, and secondly, when the carboniferous and nitrogenous principles are nearest the proportion of three to one.

" Of the various nutritive principles belonging to each set, some may " replace one another—some are better than others; some are probably " essential."

Two things however are certain, that nitrogenous may replace carboniferous food for supporting respiration, though at a great loss; but that carboniferous food (without nitrogen) cannot replace nitrogenous food for repairing textural waste.

" Dietaries ought never to be estimated by the rough weight of their " constituents, without distinct reference to the real nutriment in these, as " determined by physiological and chemical inquiry."

" Keeping these principles in view, and with the help of a simple table, it is not difficult to fix the Dietary advisable for any body of men, according to their occupation. It is also, in general, easy to detect the source of error in unsuccessful Dietaries. For example, any scientific person conversant with the present subject could have foretold as a certain consequence, sooner or later, of their dietary, that the British Troops would have fallen into the calamitous state of health which befell them last winter in the Crimea."

Indian prison Dietaries defective in arrangement.

The Dietaries of Indian prisons have heretofore been for the most part arbitrarily fixed, and without regard to the scientific data we already possess in reference to the relative

* Observations on a Report by Sir J. McNeill relative to rations for Soldiers.—1855.

values of food. For instance with Mr. Mayer's analyses of the Indian cereals, we are forced to admit that sixty-five Rupees' weight of rice does not contain anything like the same amount of nitrogenous principles which is found in sixty Rupees' weight of raggy or cholum ; and yet in the majority of the Madras Jails, these quantities are considered as equivalents or substitutes one for the other. The injudicious dietaries of our jails have a great deal to do with the excessive mortality of prisoners, though in Madras at least, there are other causes which influence their health, and especially the over-crowding and deficient ventilation of most of the jail-buildings.

Excessive sickness and mortality often due to defective diet.

Dr. Ewart* has compiled a table from official sources showing the ratio of deaths from diarrhœa and dysentery per 1000 of strength amongst sepoys and prisoners in the three Presidencies, and the results are very remarkable as illustrating the different conditions under which the two classes live as regards food and house accommodation.

Dr. Ewart's opinion.

Mortality of sepoys and prisoners from bowel-complaint contrasted.

			Ratio of deaths from dysentery and diarrhœa per 1000 of strength.
Bengal...	Prisoners...	1833 to 1854	21·65
	Sepoys......	1833 to 1852-3	1·63
Bombay...	Prisoners...	1831 to 1853-4	15·02
	Sepoys......	1831 to 1853-4	2·09
Madras...	Prisoners...	1844 to 1853	16·99
	Sepoys......	1842 to 1851	2·10

The results of improving the diet of the prisoners in the Bombay House of Correction were to reduce the proportion of sickness and mortality† according to the following table :—

Diminished sickness and mortality in Bombay jail, after improving the diet.

	Admissions per 1000	deaths per 1000 strength.
Under—The old and deficient diet for 10 years...	1,768	64· 5
The new improved diet for 4 years...	818	11·14

The sickness and mortality following close upon unscientific tampering with the diet scale of prisoners in the Alipore jail, according to Dr. Strong‡, was followed by an increase in mortality, from 42·4 per

Evil consequences of tampering with diet in the Alipore jail.

* Ewart on the Sanitary condition of Indian jails, page 60.
† A contribution to Dietetics by A. H. Leith, M. D., Bombay Medl. and Phys. Soc. Trans. 1851-52.
‡ Indian Annual Medical Science, No. 5, October 1855.

thousand to 117·5. Here, by order of the Magistrate, the food was reduced from 45 ozs. per diem to 27½ ozs., which was *obliged to be consumed in a single meal.*

Dr. Ewart calculates that in this reduced diet, the nitrogenous nutriment instead of being in the proportion of one to three, as science has shown to be necessary, was only in the proportion of 1·49 to 19·42 !

Existing jail diets.

In the following table is given the Dietaries now in use in most of the Bengal, Punjaub, and Madras jails, a portion of it has been copied from Dr. Ewart's table at page 72 of his work on the Sanitary condition of Indian jails. In most of the Madras prisons however, the quantities of condiment, salt, and animal food can only be guessed at, in consequence of the objectionable system of allowing a fixed sum of money to cover the cost of these articles. It is but reasonable to conclude that 3½ pice or 4 pice per diem does not represent an equal weight of condiment or animal food in every district.

Uncertain proportion of meat and condiments in Madras jail diets.

Table shewing the amount of food in Indian prison dietaries.

Articles.	Bengal.		Punjaub.		Coimbatore dry grain diet.		Madras rice diet.		Madras, now proposed by Mr. Rohde.	
	Lab.	Non. Lab.	Lab.	Non. Lab.	Lab.	Non. Lab.	Lab.	Non. Lab.	Lab.	Non. Lab.
	ozs.	ozs.								
Rice.	24	22	...	..	...	...	26	24	8	...
Raggy. ... / Cholum ... ... / Cumboo... ...	...	...	...	...	24	22	...	...	14	...
Wheat-flour. ... / Attah	...	...	20	16	...	...	...	...	...	...
Dholl	4	6	4	4	1½	½	The quantity of vegetable, dholl, condiment and meat restricted to what can be bought for 4 pice.	...	2	...
Fish or Flesh	2	...	...	...	2	¾		Do.	Condiments as at present.	
Ghee	...	...	...	...	...	...				
Oil	½	½	...	...	...	...				
Butter-milk	...	...	...	...	...	...				
			grs.	grs.						
Salt	½	½	67½	67½	½	½				
Condiments	½	½	36	36	½	½				
Vegetables.. ...	4	2	...	...	6	6				
Total...	35½	31½	24⅓	20⅓	34½	31¼	Unknown.		Unknown.	

Remarks.—The Coimbatore jail is one where the diet has been specially sanctioned, and in which 15 ounces of meat is allowed per week on account of the insalubrity of the building. In the generality of Madras prisons

it is imposible to fix the scale of solid food; but it is probably generally under 30 ounces for those sentenced to hard labor. The usual purchases with the money-allowance may be thus given:—

Dholl...	2½	ounces per diem.
Salt...	½	do.
Condiments and tamarind..... ...	½	do.
Meat or fish... ...	4	do. once a week.
Vegetables, pumpkins, cucumbers, bringals.	6	do. twice or three times a week.

Proportions of nitrogenous and non-nitrogenous principles in various prison and hospital diets.

Dr. Ewart has calculated the proportions of the nitrogenous and non-nitrogenous principles in the Bengal and Punjaub Dietaries. Dr. Wyndowe has kindly undertaken for this report the same task, with regard to some of the prison and hospital diets in Madras.

The results are given in a tabular form below.

		Carb. Nut.		Nitr. Nut.
Bengal Prison Dietary.	Non-laborers.	*5·8	to	1
	Laborers...	5·7	,,	1
Punjaub.......	Non-laborers	3·68	,,	1
	Laborers...	3·76	,,	1
European Soldiers' Rations, India.	... ...	2·3	,,	1
Madras Sepoys' Rations (Foreign Service).	... ...	8·2	,,	1
European Hospital Diet, "Full"...	... ...	2·	,,	1
Do. "Half"...	... ...	2·68	,,	1
Do. "Fish"...	... ...	3·35	,,	1
Native Do. "Full"...	... ...	7·2	,,	1
Madras Jails, Coimbatore—Laborers,	... ...	6·0	,,	1
Calicut, rice diet... ...	do. meat days	6·0	,,	1
	do. other days	9·0	,,	1
Paumben, dry grains...	do. meat day, once a week.	2·8	,,	1
	do. 6 days a week... ...	4·5	,,	1
Chittore and Vellore, mixed grain	do	5·5	,,	1
Ootacamund Native Jail	meat days...	5·5	,,	1
	other days...	8·1	,,	1

* These figures appear to be erroneously entered in Dr. Ewart's book as 14·28 for non-laborers, and 13·33 for laborers—the proportions appearing very high, I asked Dr. Wyndowe to be good enough to re-calculate the proportions for the specified food of the diet table, and the corrected proportions are as indicated above.

From this table it will be easily seen how deficient are the jail Dietaries of Bengal and Madras in the due admixture of the nitrogenous principles of food. The Punjaub scale, where wheaten flour is used, is the nearest approach to the proportions indicated by Dr. Christison as essential to maintain health and vigour for any length of time among bodies of men.

Deficient diet in Calicut. Dr. Wyndowe's suggestions for its improvement.

Impressed with the insufficiency of the diet in the Calicut jail, Dr. Wyndowe, the Civil Surgeon, not long ago submitted a proposal to exchange the 26 ounces of rice daily, with such meat, condiments and vegetable as could be bought for 4 pice, for the following scale :—

WEEKLY ALLOWANCE.

	Hard labor prisoners.	Non-laborers.	Under ½ month in jail.
	ozs.	ozs.	ozs.
Rice	112	84	70
Dholl	56	42	35
Fish	60	60	60
Vegetable	12	12	12
Oil	3½	3½	3½
Salt	7	7	7
Condiments and tamarind	8¾	8¾	8¾
	259¼	217¼	196¼
Average quantity of food daily.	37	31	28

In this allowance the proportion of nitrogenous to carboniferous nutriment has been kept as closely as possible to Dr. Christison's scale of one to three—the actual proportions being carboniferous 41·761 to nitrogenous 13·76. The cost of the hard labor diet in this scale would be a fraction more than an Anna and half per diem, or nearly three Rupees per mensem. Its cost perhaps might be materially reduced by substituting the dry grains in part for the rice and dholl and fish—the quantities of the two latter being in excess when compared with the bulk of rice.

Dr. Wyndowe considered some essential change in the diet to be necessary; as in his opinion, "the large average mortality and increasing prevalence of disease" was occasioned by "defective nutrition." Shortly after making his recommendation, and before any action could be taken on it, epidemic cholera broke out amongst the badly nourished inmates of the jail,

and in the space of two weeks destroyed about 25 per cent. of the whole strength of prisoners.

The dry grains, cholum and raggy it seems are not procurable on the Western coast; but if they cannot be economically introduced there from the adjoining district of Coimbatore, some special provision should be made in the Dietary scales of all jails on the coast where rice is the staple food, so as to make up in some degree the deficiency in the nitrogenous elements of a rice diet. Such jails will require a liberal allowance of flesh or fish, milk or curds, to be supplied to the prisoners—if the latter are to be kept up in health and strength.

Dr. Ewart's proposals for improving diet scales in Bengal.

Dr. Ewart, in reviewing the various Dietaries of prisoners in India, came to the conclusion that none of them were perfect, and he devised a scale of food himself, which is given below.

Articles.	For Bengal.		For North West Provinces and Punjaub.	
	Laborers.	Non-Laborers.	Laborers.	Non-Laborers.
	ozs.	ozs.	ozs.	ozs.
Rice	10	8	...	...
Attah	...	...	20	16
Dholl	14	10	6	2
Fish	12	10	...	...
Mutton	...	...	8	6
Butter-milk...	16	8	1	1
Ghee....	½	½	1	1
Salt	1	1	1	1
Condiments	1	1	...	...
Total weight...	54½	38½	37	27

For the class of persons who do not consume flesh, Dr. Ewart proposes curds and butter-milk in lieu thereof.

Objections to both of the proposed scales.

The objection to this scale, and in some degree to Dr. Wyndowe's, is not that the elements of nutrition are deficient or in excess, but that the shape in which those elements are provided, is not the best suited for assimilation. There is no doubt but that dholl and other pulses are very nutritious grains, and that they are very rich in nitrogenous principles. In moderate quantities this

kind of food is digested and assimilated ; but weak stomachs find a difficulty in disposing of it. It is curious that in the various Dietaries of the free population, these grains are only consumed in small quantities (the average daily allowance being from two to four ounces.) Now, Dr. Wyndowe proposes to use eight ounces, and Dr. Ewart suggests fourteen. It is highly probable that these quantities could not be digested. Peas, beans, and lentils are known to cause flatulency in those who partake of them. Dr. Hassall* remarks of this description of food—

Quantity of dholl in excess.

"When taken as an article of diet, they are found by most to be diffi-"cult of digestion, to occasion distention and flatulency, and to be slightly "aperient. These properties and effects are so similar in the case of each, "that it is almost impossible to draw any decided line of demarcation "between them. We recently partook of some of Du Barry's Revalenta "Arabica" (the meal of the lentil *Ervum Lens,*) and found the flatulent effects "so unpleasant that we should not readily be induced to repeat the experi-"ment."

In the Allahabad district and some parts of Oude, the poor people live on a kind of vetch called *Kessaree dal,* or the *Lathyrus sativus* of botanists.

This grain when used as the sole food of the people, causes paralysis of the lower extremities. Some villages have, from ten to fifteen per cent. of the population, who have become helpless cripples from this cause.

The people of the district are perfectly aware of the poisonous nature of the food ; but from the poverty of the soil of the district, it appears that no other grain will grow. Mr. Court, the Collector of Allahabad writes, "it affords the only certain means of life." The *Kessaree* grows in all seasons, and requires little or no culture.† It is not improbable that some other pulses if depended upon solely for nutriment, would have a prejudicial effect upon health.

So again with fish. It is a nutritious article of diet, and in one hundred parts contains almost the same amount of albuminous matter as beef and mutton ; yet the latter are better foods for working upon, and for satisfying the cravings of appetite. Fish is often moreover used in a semi-putrid state, from bad salting, and in this condition

---

* Hassall—Food and its adulterations, page 241.

† According to, Dr. Forbes Watson, the *Kessaree dal* is much richer in nitrogenous principles than the chick pea or pigeon pea *dal.* Experience teaches that it is unwholesome and yet if chemical constituents were the only consideration, it should be better fitted for sustaining life, than many other pulses.

it undoubtedly predisposes to disease. There is something in the relative value of these things beyond the power of chemists to explain. In the dholl, the proportion of albuminous matter is ample to support life; but nobody lives entirely upon it. The mechanical condition in which this grain reaches the stomach, or some unknown cause, prevents more than a certain quantity of it being digested, and we find that the people, taught by practical experience, do not as a rule attempt to assimilate more than a small portion. Experience teaches also, that for the sustenance of those who endure much fatigue and hard labor, fish is not equal to mutton or beef. An English "navvy"—the type of a hard labourer—having the choice of food, prefers bread and beef in about equal proportions to any other fare.

Animal food necessary to the inhabitants of India who undergo severe exertion.

The Indian palankeen bearers of the Telinga districts think nothing of running double stages, from 25 to 40 miles per diem, so long as the Sahib is regular in his present of "a sheep" every second or third day, and every particle of which, barring the skin and bones they consume. The waste of tissue incurred in severe labour must be compensated for by nourishing food brought to the digestive organs in such a form, that it can be readily acted upon by the solvent powers of the fluids of the stomach.

Dr. Mouat on Jail diets.

Dr. Mouat, the able and accomplished Inspector of Prisons in Lower Bengal, remarks of the dieting of prisoners "that "there is something radically wrong in the system "of diet is indisputable, and it is abundantly clear that the quantity and "quality of food sufficient to maintain an agricultural labourer in health when "at liberty, does not preserve him from the great plague and scourge of "jails when in confinement. On the other hand, while feeding above the "standard procurable in a state of liberty is a premium to crime, particularly "in times of famine and distress, diet ought not to be made an instrument of "punishment. The argument that a prisoner in jail gets a greater amount of "food than an honest labourer of the same class, and that therefore the good "living of the convict is more a temptation than a discouragement to crime, "is not in itself a valid reason for reducing the diet of the latter, if it can be "proved that a larger amount and greater variety of aliment is absolutely re-"quired for the same man in confinement, than was adequate to maintain "him in health when at large. All disciplinarians admit that the amount "of food to which a prisoner is entitled should be the minimum needed to "keep him in health and strength."

"It is abundantly evident that from circumstances which appear to be

" inseparable from imprisonment in every part of the world, and in every " variety of the human race which has been subjected to penal restraint, this " amount is in excess of what is amply adequate to preserve the health and " strength of the same classes and individuals in freedom."

These observations coming from one of Dr. Mowat's practical experience of the effects of jail dietaries must be allowed to have great weight in any proposal for the revision of existing scales of diet. It has been already shown that in Madras, the prisoners in jail get a less quantity of grain than the agricultural labourer ordinarily consumes, though in times of scarcity the prisoner feeds better than the cooly. Comparing the proposed dietaries with those now in use, it is evident that the prisoners are not getting under the present system a sufficient allowance of animal food.

The prisoner in the North West Provinces or Punjaub, who gets his twenty ounces of *attah* per diem, is much better provided with real nutriment than the Madras criminal who is fed on twenty-six or twenty-eight ounces of rice, and in this Presidency likewise the prisoners who are sustained on raggy, cholum, and cumboo have an infinitely superior staple for their diet than rice. In proposing radical changes in the system of jail dieting, it must be borne in mind that to secure the health and strength of a large assemblage of men in confinement certain requirements are absolutely essential.

Desiderata in all dietary scales.

The first is that the proportions of nitrogenous to carboniferous material in the food should be, as nearly as possible, as one of the former to three of the latter.

2. That to preserve health for any length of time, some *variety* in food is absolutely necessary.

3. That all dietaries should contain a proportion of animal, as of vegetable food. The present practice of allowing a fixed sum of money to cover the cost of condiments, fresh vegetables, and animal food for ordinary prisoners, is peculiar to Madras. It is erroneous in principle and objectionable in practice, inasmuch as three or four pie in one station will not purchase the same amount of spices, salt, and condiments that it will in another : in one place there may be enough surplus money to purchase meat, ghee, or fish once or twice a week. In another jail these necessaries, owing to the high price of condiments, may never come within the reach of prisoners. If animal food is withheld, the health of the prisoner suffers. Animal food in some shape, though not always as flesh, is universally consumed by all classes of the free population.

Money allowance for condiments in Madras jails objectionable.

Mechanical condition in which the food grains are allowed most important.

4. That when the chief food of a jail is made up of grain, the *mechanical condition* in which it is taken into the stomach requires consideration, as its nutritive value depends in a great measure upon whether the particles have been minutely divided or not before they are brought into contact with the solvent juices of the digestive organs.

The " bran" of wheat contains a greater proportion of gluten than the inside flour. Brown bread, in which the finer particles of bran have been ground up with the flour, is more nourishing than pure white baker's bread. If this bran is only coarsely divided instead of being reduced to an impalpable powder, the mechanical condition in which it is received into the stomach prevents its assimilation, and it passes out of the body unaltered.

This point requires close attention in the substitution of raggy, cholum, and cumboo for rice. The outer coating of the grain if not minutely pulverised sometimes irritates the bowels, and in any case it is not assimilated unless reduced to a fine powder, the full amount of nutriment of the grain being lost to the prisoners. With simple machinery there should be no difficulty in the cheap and economical reduction of these grains to a state of minute division fitted for nutrition.*

5. That with a due admixture of the cereal grains, dholl, fresh vegetables, and animal food, it is possible to maintain the standard of health amongst prisoners, provided that they are not overcrowded, and that the sanitary condition of the jail buildings is unexceptionable. In proof of this may be mentioned the fact that in the English and Scotch Prisons, the mortality of prisoners is rather below that of the Civil population at similar ages. The Guntoor jail in this Presidency, which is not overcrowded, and in which the staple food is *cholum,* shows a very moderate average of sickness and mortality, the latter probably being no more than what occurs in the free population.

---

* The arrangements for the cooking of food in jails in this Presidency appear to be generally defective and to occupy much of the time of prisoners which should be devoted to hard labor. Wheat and raggy flour combined make an excellent bread; cholum, cumboo and the smaller millets, when reduced to fine flour may be used with advantage in a similar way, and it is questionable whether the grain would not be more economically prepared in this way, a portion of it at least, than by boiling, while at the same time it would be more suitable for health.

The practice which obtain in some jails of cooking the morning meal overnight is not free for objection, particularly in seasons of the year, when fermentation proceeds with great rapidity. A loaf of bread, containing the weight of grain allowed for the morning meal, would, it is thought, be a good form of issuing the ration, and one free from objection in a sanitary point of view.

To secure that amount of variety of food which seems to be so essential to the health of prisoners, is the chief difficulty.

Rice not essential in jail diets.

In all the jails of the inland districts rice need not be used at all, or only as a special treat on extraordinary occasions. The dry grains furnish a sufficient variety, and the allowance might be so arranged as to give cholum, raggy, and cumboo on alternate days, or to give a certain weight of one or the other grain for the morning meal, and of the other for the evening. In jails situated in rice-growing districts, that grain should form only a portion of the food. Of animal food the changes can only be rung upon mutton, goat-flesh, fish, milk, curds, butter-milk, and ghee. Of fresh vegetables or fruits, the issue must always depend upon the season of the year. In some jails in this Presidency, near the lines of Railway, potatoes might be introduced in lieu of other vegetables.

Quantity of vegetable food should be fixed.

Whatever vegetables are used, the quantity should be fixed, and never diminished because of scarcity or difficulty of supply. The tendency to scorbutic affections and impoverishment of blood in prisoners subjected to a jail diet is so general and constant, that too much attention cannot be given to ensure a sufficient proportion of this kind of food.

Due proportion of condiments necessary.

The stimulating condiments demand less attention perhaps, but they should be allowed in a fair average proportion for each diet. Under the present system of a fixed *per diem* money allowance, the tamarind and salt of the prisoners' diets are, no doubt, often deficient. Of the former the quantity should not be less than half an ounce, and it might occasionally be varied if limes were plentiful and cheap by the substitution of the same quantity of lime juice. Of salt, it has been shown by physiological experimenters that at the least *half an ounce* passes away in the urine every day, and nearly the same quantity by the skin and the fæces. To replenish this constant and daily waste, and to supply the body with an ingredient so essential to it, the least quantity which should be provided is from $\frac{3}{4}$ of an ounce to *one ounce*. In the Punjaub scale the quantity allowed is only 67½ grains, which is obviously insufficient. It must be borne in mind too that the common bazaar salt contains nearly one-third of dirt and impurity. The chlorides, are of course present in all cereal grains, in milk, flesh, and in the water drunk, but the quantites are not sufficient for the wants of the body.

From $\frac{3}{4}$ to 1 ounce of salt necessary with a grain diet.

If the use of salt as a condiment is neglected, the living body becomes affected by intestinal parasites, and loss of health results.

Proposed diet for Madras jails where dry grains can be obtained.

Bearing in mind what has been said with regard to variety of food, I have attempted to sketch a dietary for a whole week, such as would I think be sufficient to maintain health, without pampering the prisoners with food unsuitable to their condition.

Articles.	Jails where dry grain is the staple.						
	Hard-labor prisoners.						
	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.	Sunday.
	oz.	oz.					
Rice	...	...	...	...	...	...	12
Raggy	16	8	16	8	...	16	12
Cumboo...	...	...	8	...	8	...	...
Cholum	8	16	...	16	16	8	...
Dholl	6	...	2	2	6	4	2
Mutton	...	8	...	8	...	...	6
Fish	...	...	6	...	...	6	...
Butter-milk	12	..	...	...	12	...	8
Ghee	½	½	½	½	½	½	½
Tamarind	½	½	½	½	½	½	½
Salt	1	1	1	1	1	1	1
Green vegetables	6	...	6	...	6	...	...
Plantain or other fruits...	...	...	...	6	...	...	6

The quantities here indicated are intended simply for those sentenced to hard labour, and who have settled down regularly to prison life. For under trial prisoners, or those sentenced to short terms of imprisonment, the quantities of both grain and meat would bear diminution. In jails where rice is the principal grain of the district, it would of course be substituted in part for cholum or raggy, but it would be desirable to introduce some dry grain for at least one of the meals per diem, as experience shows that nearly all the coast jails have been unhealthy with an exclusive rice and fish diet. The proportions of carboniferous to nitrogenous nutriment in those diets has been calculated by Dr. Wyndowe as follows :—

In rice districts, that grain should not form the whole food of the people.

	Carb. Nut.		Nitr. Nut.
Monday	3·5	to	1
Tuesday	3·2	„	1
Wednesday	3·2	„	1
Thursday	2·9	„	1
Friday	3·8	„	1
Saturday	3·3	„	1
Sunday	3·6	„	1
Average of the week	3·3	„	1

Cost of the proposed dietary probably greater than at present.

The expense of these diets will probably be rather greater than those at present in use, but the large substitution of dry grains in lieu of rice will allow a considerable margin for the purchase of animal food. It must be remembered moreover, that the necessity for *extra* animal food with this dietary scale will scarcely ever arise. Whether the cost be increased or diminished, the absolute necessity for a general improvement in the diet of prisoners is evident, if the lives of imprisoned subjects are not to be unnecessarily sacrificed.

Alteration in diet scales absolutely necessary to maintain the health of prisoners.

Nervine stimulants.

In reference to these dietaries, it will be observed that they make no provision for the supply of the class of articles alluded to as nervine stimulants.

Tobacco, Indian hemp, and betel nut, are used by all classes of the free population. The toddy of the different varieties of palm, either fresh or fermented, is also very commonly used. Distilled liquors are largely consumed by some classes. Opium eating and smoking prevails to a considerable extent in some parts of the country. All these things are rightly considered in the light of "luxuries," and forbidden to prisoners in jails. Those who are employed on works outside the jail walls, and the whole of the hard labor prisoners at present come under this class, have the means of receiving many little extra articles of food or luxuries, such as tobacco and betel from their friends, and it is sufficiently notorious that they do so receive and use them as opportunities offer.

Supposing however prisoners to be kept entirely within a jail enclosure, the entire deprivation of articles of this class would probably be injurious to health.

Use of tea and coffee suggested.

Instead of supplying arrack, or betel, or tobacco, it is a question for consideration whether coffee or tea might not be issued to hard labour prisoners with their evening meals as a means of preventing undue waste of tissue during confinement.

I have not entered into the question of the propriety of revising the ration list of Sepoys on foreign service, or of effecting changes in Civil Hospital diets, or of the sufficiency of the food laid down by law for emigrants from British India to the Colonies, all of which dietaries are unscientific in composition, and there need be little hesitation in stating, unfitted to support life.

The large mortality of emigrants on long voyages, and of Sepoys on foreign service, I have no doubt is due in some degree to the unsuitableness of the scale of food laid down for them. The whole of these dietaries appear to require revision.

IV.—On the connection between the nature of food, and the physical and mental condition of the people.

In concluding this notice of the elementary substances employed as food by the inhabitants of Southern India, the subject would scarcely be complete without a brief allusion to the effects of the various dietaries in a physiological and pathological point of view. Looking to the history of India in past years, we shall generally find that the people who have occupied the rich alluvial plains of the great rivers, or of the sea-board, have from the profusion of cheap food, increased and multiplied faster than in those districts where Nature has been more sparing of her supplies. Cheap food, notwithstanding the disturbing elements of war, the tyranny of despotic rulers, and the ravages of pestilence, has in all cases tended to favour a rapid increase of population.

The staple food of the people living in such situations has been chiefly rice. In the successive dynasties to which India has been subjected from remote antiquity, each race has had to submit in its turn to the foreign invader. In adopting the dietary of the conquered people, and feeding upon a grain deficient in those qualities which go to form flesh and blood, the northern invaders have become as effeminate as the original owners of the soil.

As observed by Macaulay, "It is certain that a succession of invaders descended from the west of Hindoostan, nor was the course of conquest ever turned back towards the setting sun, till that memorable campaign in which the cross of St. George was planted on the walls of Ghiznee."

The fierce and warlike nations which have in past times devastated the rich plains of India, and tyrannized over the defenceless people inhabiting

them, have all been consumers of a more nourishing food than rice. It may be safely argued, that if the people had been fed upon the simple diet of the inhabitants of the plains, these conquests would never have occurred. The physical powers and moral courage necessary to the achievement of feats of valour and conquest, have never yet been found in a people who, like the degenerate races in the plains, live on rice and eschew animal food.

The physical and mental characteristics of the Bengalees, as painted by Macaulay, are so descriptive in a *physiological* sense, of what might be expected of a people feeding chiefly on a carboniferous diet, that one can scarcely refrain from concluding that they bear the relation of effects and cause.

"The physical organization of the Bengalee is feeble even to effeminacy. "His pursuits are sedentary, his limbs delicate, his movements languid. "During many ages he has been trampled upon by men of bolder and "more hardy breeds. Courage, independence, veracity, are qualities to which "his constitution and his situation are equally unfavourable. His mind "bears a singular analogy to his body. It is weak even to helplessness for "purposes of manly resistance, but its suppleness and its tact move the "children of sterner climates to admiration not unmingled with con- "tempt. * * *

"Large promises, smooth excuses, elaborate tissues of circumstantial "falsehoods, chicanery, perjury, forgery, are the weapons offensive and "defensive of the people of the lower Ganges. All those millions do not "furnish one sepoy to the armies of the Company."

Without accurate statistics of population it is scarcely possible to say how far the rice eating people of India are wanting in average duration of life. The general impression of Medical Officers who have been brought much into contact with them is, that the value of life is low amongst those who subsist chiefly upon rice. They become fat, bloated, and incapable of much exertion. This tendency is no doubt increased by the amount of *ghee* and *sweetmeats* consumed. Decay of the vital powers usually sets in early ; men become grey headed in early manhood ; Dyspepsia in its protean forms is a common malady. Furuncular diseases are very common in the middle aged, and often associated with diabetes. Diarrhœa, depending upon want of a due amount of nitrogenous nutriment in the food is very common, and, in jails especially cases of this kind are found after death, to be marked by extensive ulceration of the mucous surfaces of the large

intestine. General dropsy, and a tendency to serous effusions into the cavities of the pericardium, thorax, and abdomen are only the evidences, as indeed are the other symptoms just noticed, of an impoverished condition of the blood,—of a vital fluid deficient in reparative or plastic material.

Hence, as might be expected, the rice feeders are the chief sufferers from anasarca, and the peculiar affection known as beri-beri. They suffer as a rule rather more from miasmatic diseases specially intermittent fevers and their sequelœ than Europeans, or people who live after the European fashion.

From all that has been said on this subject it may safely be predicted, that a people whose chief food is rice are not destined to achieve distinction or fame in the history of nations. Incapable of severe labour, or of the courage and physical capacity for resisting the aggressions of outward foes, or of carrying war into an enemy's country, they will probably remain in the physical condition which Macaulay so truly describes in his picture of the Bengalee. The habits of caste, and customs of fore-fathers may however be put aside in the progressive development of civilization, and in that case if the Hindoo of the rice districts can be brought to understand that a due proportion of animal food is essential to his well being, in eking out the supply of nitrogenous material in which his staple food is so deficient, the future history of the nation may be widely different for the past.

Viewing the other side of the question, we observe that the warlike invaders who from time to time have overrun the plains and valleys of the rice producing districts have invariably come from localities where a richer diet is used. The Affghans, Seiks, Beloochees, Rajpoots, Mahrattas, Rohillas, Mysoreans, and in fact every people who have ever conquered the lowlands of India, have acquired their chief sustenance from food superior in nutritive value to rice.

It is often argued that climate is the chief cause of the observed differences in the characteristics of the people inhabiting the hills and table land of India, and that food is only of secondary importance in producing them, but from a due consideration of the matter in all its bearings it seems that climate, except that it influences very materially the natural products of a district, does not affect the mental and physical characteristics of a people as much as has been generally supposed.

The supposed "fact" that the natives of India lived exclusively upon a highly carboniferous diet has always been an anomaly in physiology. If the deductions from our present knowledge of the laws of life are correct,

less carboniferous material is required by the human body in hot countries than in cold, but we have already seen that the rice eating population consume an undue proportion of that material.

It has also been shown most conclusively that they do so at the expense of their physical strength, capacity for labour, and chance of a long and healthy existence. The anomaly disappears on close investigation, and physiological laws are shown to admit of no exception. As a man requires so many cubic feet of fresh air to breathe per diem, so it is essential that there should be certain elements in his food to sustain him in health and strength. The laws of Nature regulating these matters cannot be infringed either ignorantly or wilfully with impunity.

The use of animal food by Europeans in tropical countries, except in very moderate quantities, has been condemned by some medical authorities of repute, on the ground of its predisposing to diseases peculiar to the country. The reasoning by which such an opinion has been arrived at does not appear however to be very conclusive. In the first place we find in the animal kingdom that all the larger flesh-feeding animals are inhabitants of the tropics. Secondly, that man's instinctive feeling if it be not interfered with by civilization, is to eat plentifully of animal food. In central and southern Africa, the various Kaffir tribes will gorge themselves with flesh whenever they have the opportunity. To such an extent does the desire for animal food proceed in some districts, that it amounts to a positive disease, the symptoms of which have been well described by Livingstone, Du Chaillu, and other African travellers. The inhabitants of the Fan country rather than deprive themselves of animal food, indulge in cannibalism of the most revolting forms. The aborigines of the Andaman Islands, (who according to Professor Owen are probably the remnant of a primitive and otherwise extinct race of mankind) although living under a fierce tropical sun, and in the midst of moisture and vegetation, subsist almost entirely upon fish and the flesh of the wild pig. They do not cultivate. The aborigines of Australia are chiefly animal feeders. The Chinese, Malays, and Burmese eat a great variety of animal food than do the nations of the West. The American Indians live chiefly on the produce of the chase. So do all the hill and jungle tribes in India.

All these people are large flesh eaters, and they live and thrive in countries which are as hot and moist as the plains of Bengal. If animal food can be so largely assimilated by these various races without injury to health, it seems scarcely fair to charge the prevalence of disease amongst Europeans

in the tropics to its liberal use. It may not be generally known, but it is nevertheless a fact, that the natives who use a diet deficient in animal food, are more liable to be attacked by miasmatic diseases than Europeans, who use it freely. The proof of this is to be found in the greater proportion of admissions to strength from cholera, fevers, &c., in native troops, jails, &c. than amongst European troops.

The conclusion to be arrived at from a consideration of all these facts is, that when Europeans are called upon to undergo active exertion in a tropical climate, the waste of their bodies is best met by a plentiful supply of animal food, and that instead of being injurious, it is the food most plainly indicated by nature as the safest and best. Food of this kind is essential to those who live an active life in the open air. It is only injurious when indulged in to excess by those who live in darkened and ill-ventilated appartments as many of our soldiers do, and who at the same time take little or insufficient exercise. It has been observed that tigers and cheetahs are found to die of abscess of the liver when shut up in cages in this climate, and thus deprived of their natural exercise.

These causes probably operate in producing liver disease amongst the European residents in India. A remarkable instance of the converse of this is afforded in the history of the Madras Fusiliers during the memorable campaign of 1857-58 in Bengal. The regiment for months together underwent the greatest amount of peril and hard work in field and garrison. War and pestilence played great havoc in the ranks of the corps; but with all the exposure to climate, changes of temperature, the excesses in eating and drinking, want of clothing, and occasional scanty fare incidental to field Service, there stands out the remarkable fact, *that not a single man died of abscess of the liver*.

This notice of the food of the population of Southern India is, I am aware, very imperfect. The inquiry has, I trust, thrown some light upon the subject of Indian prison dietaries, and if it should result in a re-arrangement of the articles of food more in accordance with the teachings of Nature and science than at present, the chief object of it will have been accomplished; at the same time some popular errors regarding the nature of the food of the free population will have been corrected.

W. R. CORNISH,
ASSISTANT SURGEON,
Secretary to the Principal Inspector General,
Medical Department.

MADRAS,
June 1863.

Extracts from Reports of Medical Officers on the nature and amount of the food of the labouring classes as compared with the dietary scale allowed for Prisoners in Jails in the Madras Presidency.

BELLARY.

By Surgeon Major J. M. Jackson.

"In the three southern taluqs of Bellary, raggy is the staple food of the labouring classes, and cholum in all the other taluqs. One seer or measure, weight 84 Rupees of either, is ordinarily a poor or labouring man's quantum for the day. The raggy, when cleaned and husked, is principally used by reducing it to flour, and boiling it with water, so as to bring it to a thick, and almost hard consistency—the flour is also used by being made into cakes, but it is rarely eaten in this way.

Cholum is chiefly used by being broken (after it is well cleaned, and husked) and cooked similarly to the way rice is boiled, and cakes made of it. Mussulmans prefer the cakes, but almost all other castes eat the cholum the other way as boiled.

Rice is chiefly used by the Brahmins and people of the Tamil caste, and by all castes when they can afford it ; of this grain a little less than a seer or measure weight of 84 Rupees will suffice a man for the day.

Cumboo is a grain which is very little used, as it is of a heating tendency ; it is resorted to more by way of change than as ordinary food.

Prisoners are allowed by Government a certain diet, which if adhered to, would I think suit well the constitution of the prisoners generally."

CALICUT.

By Assistant Surgeon E. S. Cleveland.

Appended to this brief account of the food of the people of this district, is a tabular statement showing the nature, quantity, and quality of such articles of consumption as are for the most part used among them.

Rice stands prominently as the chief staple article of food. A Malabar seer weighing about 60 tolahs.

Raggy, chennah, and indigenous pulses are much used in Wynaad, with bulbs and common fruits among the hill people. There is probably a smaller consumption of meat in Malabar than in any other district in southern India. Though luxuriant in vegetation, it is not a country suited to cattle. Poorer cattle indeed are not to be seen in any district than in this. An ordinary leg of mutton is about the average size of an English leg of lamb, weighing little over 3 lbs. Meat is coarse and ill-flavoured, and almost wholly wanting in fat ; the quality obtained by the Natives at a cheaper rate is many degrees inferior. Ill-conditioned cows are often seen stunted to the size of English sheep. In this respect as in many others, this district stands in striking contrast to the neighbouring one of Coimbatore, which is most barren in vegetation, and yet where the finest sheep in southern India are obtained. The small consumption of animal food among the inhabitants of Malabar is due moreover to the prohibition by Sastra, of beef, among the bulk of the Hindoo population, the Nairs and Tiers, no less than of pork among Mohamedans, the Moplahs of which sect form a populous section.

Fish is very plentifully used along this coast, and doubtless many of the poorer inhabitants, subsisting as they do almost exclusively upon it in substitution of meat, thereby suffer disease in multiform shape, primarily in bowel complaints, through the consumption of non-cleansed scaly particles and much calcareous matter ; such diet with other causes, inducing a spanemic condition of blood, and giving rise secondarily to the numerous cutaneous and ophthalmic affections so generally prevalent, as well as the large percentage of organic disease resulting in anasarca and death, the origin of which may rationally be ascribed to poverty of blood.

Among the vegetables, pumpkins, yams and cucumbers are more abundantly used than the bendakai, brinjal, and other indigenous products.

The plantain, jack fruit, melon, and mango among fruits, each and all of which are largely used when in season.

The cocoa-nut of Malabar, which is its principal source of revenue, it is needless to add, enters also largely among its articles of consumption, and no tree is turned to such useful account, unless it may be the palmyra of the opposite coast.

Nature and amount of food of the labouring classes of the District of Malabar.

MAHOMEDANS.				HINDOOS.						CHRISTIANS.			
MUSSULMEN.		MOPLAHS (PRINCIPALLY TRADERS.)		NAIRS (PRINCIPALLY RYOTS.)		TIERS.		CHERMAHS (SLAVES.)		NASURANIES NON-LABOURING.		EAST INDIAN PORTUGUESE.	
Quality of food.	Daily quantity.	Quality of food.	Daily quantity.	Quality of food.	Daily quantity.	Quality of food.	Daily quantity.	Quality of food.	Daily quantity.	Quality of food.	Daily quantity.	Quality of food.	Daily quantity.
Rice, animal and vegetable food.	Mussulmen do not generally engage in arduous out-door work; their principal food consists of rice with highly flavoured curries, prepared with meat and vegetables—about a seer and a half of rice is the daily consumption per man.	Rice, meat, vegetables and fruit.	A seer and a half of rice per man daily, either boiled and used with a vegetable curry, or reduced to flour and made into cakes. Jack fruit, mangoes, and plantains are much used when in season. Except on feast occasions, meat is rarely used as an ordinary meal—pork of course is wholly eschewed.	Rice, dholl, and vegetables; very little of meat, beef excepted.	Less rice is consumed by Nairs than by Moplahs, about 1 or $1\frac{1}{4}$ seer suffices for one man, a larger proportion of vegetables is taken, consisting of yams fried or made into curries, with dholl. Meat is only sparingly used on feast days.	Rice, fruit, vegetables, fish and little of meat, beef excepted.	Tiers chiefly subsist on rice, boiled or reduced to a conjee, with a little of cheapest fish made up as a curry; 1 or $1\frac{1}{4}$ seer is about the daily quantity. A mid-day meal of the jack fruit or common plantain is made. Beef is not taken by these people.	Fruit, rice, vegetables and fish.	Chermahs eat less than Tiers; about a seer a day per man suffices; they use a larger amount of cheap fish, also bulbs whenever procurable and substitute cheaper grains as " chennah,‡ &c," when in season for rice.	Rice, vegetables, and fish.	Nasuranies subsist upon much about the same food as the Tiers; they are not forbidden to eat any kind of flesh or fish.	The Portuguese live much as Europeans.	Two or three meals per diem as Europeans.

CANNANORE.

By Surgeon Major J. A. Reynolds.

The food of the labouring people of this district generally consists of rice of the second sort, about two, or two and half lbs. daily, with fish or vegetables; meat very seldom; two meals a day: conjee in the morning, and fish or vegetables with rice in the evening. These people are generally robust, and healthy looking.

The following is the scale of diet for prisoners. Rice, second sort (country) 1 lb. 10 oz. daily, and 3½ pice is allowed each for the purchase of condiments, viz., vegetables, curry stuff, &c. The vegetables in use are generally country greens, pumpkins, green mangoes, and plantains, and as the prisoners have to provide also firewood and cooking utensils and other requisites, the condiments must be of the cheapest and most inferior description.

A working party only is confined here. I believe that the place used as a jail, which has been already described in my Annual Report, is more likely to produce disease among the prisoners than any system of diet that might be adopted.

CHITTOOR.

By Assistant Surgeon A. Gamack, M.D.

The principal article of food amongst the poorer people in this district is a grain called raggy, whilst the wealthier live on rice; but as raggy is much cheaper than rice, the majority use part of both. The cooking of both is the simplest possible, being merely boiled, the raggy being first ground to a powder and then added to boiling water till the mixture becomes something like porridge. Those who live almost entirely on raggy are the very poorest, and have a great deal of sickness amongst them, which I have no doubt is in a great measure caused by their food being but partially cooked on account of the expense of the firewood, as it requires to be boiled for at least half an hour before it becomes wholesome.

For some time, raggy without rice was given to the prisoners in the jail, but as the sickness amongst them, especially Diarrhœa cases, was considerably increased, they were after a few months' trial allowed a proportion of rice. The following is the scale now adopted for a labouring convict in the jail, where so far as I am able to learn, the mortality is much less than amongst the labouring classes generally.*

* Note.—The average mortality in the Jail is at the rate of 39 per thousand of strength, and it is scarcely probable that this ratio is exceeded in the free population. W. R. Cornish.

Raggy................$\frac{7}{8}$ lbs. } daily.
Rice......................$\frac{1}{2}$,, }

The prisoners are besides allowed four pice daily to buy firewood, dholl, vegetables, salt, curry stuff, &c. as they choose, but they are obliged to purchase animal food once a week. The ordinary diet of a poor man is plain boiled raggy, with a little salt and tamarind chatney, which I have no doubt would be a wholesome diet if sufficiently cooked, and a due proportion of animal food added to it. Those who can afford it have curries, meat or vegetables daily, once, twice, or thrice a week according to their means. I consider the jail scale the best that can be adopted for daily use, although the prisoners complain of not having enough; this I believe arises from their having formerly been in the habit of using a much greater quantity one day and much less the next, a habit which doubtless has an injurious effect on the health of the inhabitants and tends to shorten life.

CHINGLEPUT.

By Assistant Surgeon John Shortt, M.D.

The diet of the labouring population is dependent on the different seasons, and the kind of cereals or other grains that are procurable.

Rice is the staple food. There are upwards of forty different varieties produced in the district, all of which are used according to the seasons of the year in which they are cultivated.

Rice is husked, cooked and uncooked, but the majority prefer the cooked. That is to say, that the paddy is first well boiled and then dried in the sun till it becomes quite hard, when it is husked and sold in the bazaars. Rice from the unboiled paddy is much whiter than that from the boiled paddy, consequently the former is termed "table rice," and is that which is generally laid on our tables. It is preferred more on account of its colour, but is believed not to be so conducive to health as the rice from boiled paddy.

People unaccustomed to the use of table rice, or rice from the unboiled paddy, invariably suffer from derangement of the stomach and bowels after eating it; this fact is well understood by the Natives.

It is necessary that paddy should be kept at least six months before it is cooked, to allow time for the complete consolidation of the grain. If paddy that has been recently harvested be used before that time, it invariably causes derangement of the bowels, no matter whether it be rice from the

unboiled or boiled paddy: the more recent the age of the paddy, the more liable is it to derange the bowels.

There is also a difference in the quality of new and old rice.

New rice. Twenty-four and a half ounces of this rice boiled with six pints and twelve ounces of water took 37 minutes to cook. On straining the rice, the conjee water was 3 pints, 8 oz., with a specific gravity of 1·005. Weight of the rice when boiled, 64½ oz. The grains of the boiled rice are soft and inclined to be pulpy. If kept cold twelve or sixteen hours, it parts with a quantity of fluid and becomes quite soft and unfit for food.

Old rice. Twenty-four and half ounces of this rice boiled in six pints and twelve ounces of water, took exactly one hour to cook. The strained conjee water measured 3 pints: specific gravity 1·001. The rice weighed (after being boiled) 64½ oz. The grains of the rice were firm and fit for food after 30 hours keep, and it had not parted with its fluid nor become soft.

It will be seen that the new rice is boiled in half the time it takes to boil the old. The conjee water exceeds that of the old by 8 oz., and has a greater specific gravity; although the weight of both old and new rice is the same when boiled.

The new rice is sold in the bazaars generally in the months of January, February, March, and April. In these months bowel derangements prevail in the district, as also in the jail when the new rice is supplied.

The prisoners in the Jail, as well as the natives of the district immediately know the new rice and complain bitterly, in most instances, when obliged to use it.

Raggy and cumboo are used as food in the months of March, April, May and June, and Varragoo in the months of October, November, December and January. When the labouring classes can they partake of three meals, one cold, and two hot. The cold meal is partaken of at 6 A. M., ere they turn out to work, and they have one hot meal in the middle of the day, and the other at night. When two meals are partaken of, the first is cold and is eaten about 11 A. M., and the second is cooked at 7 P. M.

Many poor people live on a single meal a day, and that taken at irregular hours, but generally speaking late in the evening. I have here divided the labouring population into three classes.

Diet of the lowest or class No. 1, which may consist of either a single meal or two meals a day. Rice as already stated is the staple food when procurable, in the absence of which, the following mixture is made

into a kind of porridge termed "cooloo." Raggy flour 12 oz., rice or varragoo 6 oz. is boiled with a sufficient quantity of water into a thick gruel and is eaten hot or cold. It keeps well for about thirty hours, after which it is likely to get fermented. Cumboo is substituted for raggy in the months of March, April, May and June.

Either of these grains singly or compounded are mixed with water and baked into cakes like those called "chuppaties," sometimes they are stirred into a very solid kind of porridge or mass, which is called "cullee."

These meals are seasoned with a few greens or other vegetables, or a little boiled dholl. Should they have the means, the vegetables and dholl are curried with the following condiments.

Chillies, $\frac{1}{4}$ oz.
Coriander seeds, $\frac{1}{4}$ oz.
Turmeric grains, 20.
Onions (when procurable) $\frac{1}{2}$ oz.
Tamarind, $\frac{1}{2}$ oz.
Salt, 1 oz.

The first three articles are ground into a stiff paste with water and mixed with the vegetables, and in some cases with dholl and vegetables. The onions are broken into pieces and thrown in, and when to these a sufficiency of water has been added, it is placed on the fire and allowed to boil; when it begins to bubble, the tamarind is dissolved in a little water and thrown in. It is then boiled again a short time and taken down for use.

Sometimes either a little dholl, a few green tamarinds or some other ingredient is ground up into a chatney with a few chillies and a little salt. One or either of these form the only articles for seasoning their food. This class of Hindoos eat meat, pork or fish, the latter fresh or dried when they can procure it, but this never happens above once or twice a year. If pariahs, they eat beef, pork, mutton, fish, &c. This class eat meat perhaps much more frequently, as they devour all the cattle that die in the neighbourhood. Meat and fish is curried in the same way as vegetables.

Chucklers in addition to the above eat horse flesh whenever they can get a dead carcase.

Class No. 2.—This class from being a little better off use rice and the other dry grains the same as class No. 1. Their curries are generally better seasoned with condiments. In addition to those mentioned in No. 1, they use from 10 to 20 grains each of mustard, cummin seeds and garlic.

When the curry is cooked, they "change chatties" as they term it. That is, they place another chatty on the fire to get hot: when hot, they throw in about an ounce of cut onions and twenty grains of a composition termed "vendium;" as soon as these are browned, they put in about an ounce or an ounce and a half of ghee to fry the onions and vendium, when the curry is thrown into the boiling ghee and covered up for about ten minutes. It is then taken down and is fit for use after the necessary quantity of salt has been added. This class as a rule partake of two meals a day, and make use of meat or fish occasionally, but never oftener than once or twice a month.

Class No. 3.—This class invariably partake of rice cooked, and curries prepared much in the same way as class No. 2; in addition they eat tyre or sour milk formed into curds. They partake of three meals, the mid-day meal frequently consists of rice made into cakes with jaggery or coarse sugar, and fried in ghee or gingelly oil. Brahmins use the same kind of curries with their rice, except that they are seasoned in addition to the other ingredients with assafœtida, and they make use of milk, tyre, and ghee more largely. Brahmins and Hindoos of the Siva tribe do not eat the flesh of animals or fish.

Mussulmen live on rice and curries, the latter made of meat. They eat beef, mutton, fowl, fish, &c. at every meal if they can afford it.

Diet of the Prisoners in the Jail.

The prisoners are dieted on the following scale.

	lbs.	oz.	
Rice	1	$10\frac{1}{2}$	
Dholl	,,	$2\frac{6}{8}$	
Chillies	,,	$\frac{2}{8}$	
Coriander...	,,	$\frac{1}{8}$	and 21 grains.
Pepper...	,,	,,	30 do.
Vendium	,,	,,	10 do.
Cummin seed	,,	,,	10 do.
Mustard seed	,,	,,	15 do.
Onions...		$\frac{3}{8}$	
Garlic		$\frac{1}{8}$	20 do.
Turmeric		,,	30 do.
Salt...		$1\frac{1}{8}$	
Tamarind		$\frac{5}{8}$	

Which they cook into a meal in the afternoon, one half they partake of then, and the other half they eat cold ere they turn out for work in the

morning. The dholl is cooked into curry with the condiments they get. They also have vegetables two or three times a week, and are allowed to exchange the value of their curry stuff for meat every Sunday.

On reviewing these diets, it will be seen that the prisoners on the whole fare much better than the labouring population in regard to their diet; as a proof of this, after remaining a short time in the jail, they gain considerably in flesh, and the regular food and exercise maintains them in an excellent state of health. In some instances no doubt the confinement depresses them very much, but ere long they become reconciled to their incarceration, and enjoy as much happiness as a prison life admits of.

The quantity of food the prisoners get in this jail is ample and of the best quality, much better both in quantity and quality than they could have had in their own houses. They themselves are aware of this. The only complaint they ever make is, when obliged from scarcity of old grain in the district to eat the new rice. I have no doubt myself, that new rice does produce derangement of the bowels, and leaves I believe, a predisposition in the patient to take other diseases.

List of the principal green vegetables used in the Madras District.

In the months of *April, May* and *June.*

Pooseeneekai or Cucurbita pepo.
Pavakai or Momordica charantica.
Arraykeeray or Amaranthus polygonoides.
Green mangoes or Mangifera indica.

In the months of *July, August* and *September.*

Green plantains, peduncles, flowers and root bulbs of the Musa paradisica.

Drum sticks or Moringa pterygosperma.
Thundookeray or Amarantus oleraceus.
Moollookeeray or do. spinosus.
Sirrookeray or do. compestris.

In the months of *October, November* and *December.*

Shorakai or Cucurbita lagenaria.
Peerkunkai or Cucumis acutangulus.
Avarakai or Fabia vulgaris.
Podalangkai or Trichosanthes anguina.
Moolungee or Raphanus sativa.
Vendeekeeray or Trigonella fœnum grecum.

CHICACOLE.

By Assistant Surgeon W. H. Rean, M.D.

The dietary of the prisoners is in conformity to the scale laid down in the code of Medical Regulations, the cereal supplied being rice, of which all working prisoners receive 70 Rupees weight and an allowance of 3½ pies per head for purchasing meat, condiments, vegetables, fish, &c. They are enabled with this allowance to obtain meat and fish two or three times a week, and on the other days vegetables (brinjalls and watery fruits) form their curry.

This scale I believe to be superior to that of the generality of the lower classes, for on enquiry I find that few of them can obtain rice for all their meals, and that cheaper grains, cholum, raggy, and cumboo are made use of at the earlier meal of the day.

A cooly will usually commence the day with conjee, &c., perhaps a little rice remaining from the last repast of the previous day, he will partake of a substantial mess of raggy in the middle of the day, and at night will take a hearty meal of curry and rice. This is the staple of his nourishment ; if in a state of much poverty, he will be obliged to content himself with a few brinjalls or some succulent vegetable to form his curry with, and an occasional taste of fish or meat.

Those who cannot even procure rice live entirely on cholum, cumboo or raggy, whilst on the other hand the richer classes do not touch these grains. With the people rather better off, the day is commenced with rice and butter milk, the mid-day meal consists of curry and rice, and the evening repast of the same ; amongst all except Brahmins meat is taken if possible, and thereby a large supply of nitrogenous material is furnished to the body. With all classes dholl is occasionally taken, whilst amongst the poor various leguminous seeds are used for food in greater or less quantity.

I believe that when rice can be procured with a sufficiency of nitrogenous materials in the shape of meat, eggs, fish and milk, it is invariably preferred, and that just in proportion as the individual is poor and unable to obtain these articles, he has recourse to the other grains and beans which contain a large proportion of proteinous material, but in a form less easily digested than animal food ; it is not surprising therefore to find the poor of this part thin and spare, and not well able to bear up against severe sickness.

There is no rule for the precise description of diet of the poor man, if by any chance he is enabled to procure meat and milk he will do so, consider-

ing that he improves his health and strength thereby, next in order he considers fish and then vegetables.

Sugar cane is a luxury of the higher classes in this part, and wheat is occasionally taken in cases of sickness.

No peculiarity exists in the mode of preparing the various grains for food, raggy is allowed to soak for sometime, and then boiled so as to form a sort of porridge, and cholum is powdered first; salt or salt-fish is used with these grains.

Ghee, oil and spices are used also to flavour the dishes, the quantity of each employed depending entirely on the resources of the individual, the wealthier he is, the more freely will he partake of them.

With reference to the effect of the diet supplied to the prisoners and its influence on their health, I have little to state; there is no reason to believe that they suffer in any way from the food they partake of, and I believe that the deaths of those from the low country scarcely exceed the percentage of free persons, but the deaths from prisoners sent from the hills is very high, and having little opportunities of judging how these men live in their wild state, I am unable to tell what effect the diet has on them, but I believe a want of sufficient active exercise has much influence on their health, and if this could be obtained, a much less ratio of mortality would prevail.

COCHIN.

By Assistant Surgeon F. Day.

I beg to submit the following brief observations, on the comparative mortality of prisoners in the Cochin jail, as compared with that obtaining in the labouring population of the surrounding country; and likewise, a short synopsis of the diet which both classes subsist on.

During the last four years, the mortality of the prisoners in the Cochin jail from all causes has been eight, or one in every twenty-four convicts yearly. This includes one individual, who committed suicide; one who, unable to obtain subsistence, owing to age and infirmity always stole articles to be in prison, where he ended his days in peace, and he suffered severely from *elephantiasis arabum* of all his extremities, as well as from bronchitis; and another, who was confined because he was a violent lunatic. If those three are excluded, it would leave the mortality *as one in thirty-seven prisoners yearly*, exclusive of what may be termed extraordinary causes.

In British Cochin, the population is a little over eleven thousand, and the mortality, (see Table No. 1) during four years in which it was kept was one in twenty-four yearly: excluding persons who died from epidemics, or extraordinary causes, one in thirty-three.

A comparison of the prevailing rates of mortality would show that the deaths in the jail from all causes are identical in number, with that obtaining amongst the civil population; excluding extraordinary causes, it is less inside the jail than without its walls.

A few observations are here necessary upon the suggestion as to whether punishment in the jail may not be rendered more severe by the simple fact of persons being confined there. This apparently has relation to high caste Hindoos, and the messing system of Bengal, not of this portion of India; still a short account of what is done in the Cochin jail may be deemed necessary.

Convicts in Cochin do not labour within the jail walls, but in fine weather mend and sweep the roads and do other light work about sufficient to keep them in health, but nothing like what would be expected from common coolies who work for their living: even when out in gangs, they may often be seen purchasing things in the shops and bazaars. The jail itself is the old Portuguese Bishop's residence, an upstair house, having a tiled roof and boarded floor: it is not exposed to the prevailing winds, is never overcrowded and is far superior to any native house.

In fact, native convict life in Cochin does not generally appear a miserable one, their residence is good: they have no out-door exposure worth speaking of: good diet and medical attendance within call.

The very fact of a Hindoo entering a jail involves loss of caste for the time being; even were he permitted the free exercise of all his observances, and it should be stated that caste prejudices are allowed full scope.

The only pariah last year in jail was not allowed to cook in the cook-rooms, or eat his meals where the other prisoners do.

Diet.—The majority of convicts are Native Christians, which sect predominates in British Cochin, and although they have four caste divisions obtaining, still they are hardly so strict in their observances as the Hindoos.

In the *native state*, the proportion of each sect is as follows:—

Hindoos,	81·5	per cent.	of	the	population.
Christians,	13·5	,,	,,	,,	,,
Mahomedans,	4·6	,,	,,	,,	,,
Jews,	0·4	,,	,,	,,	,,

The Brahmins may be sub-divided into the Namboories or those of the country, and Poties or foreign Brahmins. But this last should include the Konkinee Brahmins (numbering 5,763) who will eat fish.

The *Kshatriyas* and *Vysians* are very few in number.

The Soodras are the majority of the population: for amongst them must be included the pariahs, slaves and out-castes, unless they are placed in a fifth supplementary list.

Highest amongst the Soodras are the Nairs of Malabar, but their subdivisions are too numerous to name them. * * *

The diet in the jail is the same as laid down in the Medical Code—no deviations occur unless a necessity in a medical point of view arises: it is certainly ample and nourishing, and does not give rise to diseases of any kind or description.

A labouring native, who is to a certain extent his own master, commences the day by pounding about a quarter of a pound of brown rice, and boiling it in a pint of water, to which some salt is added: some also put in butter milk. He takes nothing else (except perhaps some opium, or a smoke) before ten or eleven in the day, when he expects his wife to have his breakfast prepared. It consists of about a pint of raw *brown rice** from Palghaut, which is most carefully boiled, and thus increased to above double, and with it he generally if near the sea-coast, has fish fried in cocoanut oil, or else a fish curry—a curry is made of a little chilly, pepper, tamarinds, salt, &c. and then fried in cocoanut oil. The native Portuguese invariably add to this country vinegar, and some of them eat *white rice* instead of brown, as do most of the Tamil people, who come from the other side of the Western ghauts to reside in Cochin.

Poorer classes, and in dear seasons labourers, eat millet (Paniacum miliaccum) pounded into flour and made into conjee of any consistence the individual pleases. With it, fish of any sort procurable, or shells, as ampullariæ, unionaciæ, &c. are eaten.

Besides the above, yams of many varieties flourish all over the country; arrowroot, especially the yellow is wild every where. The jack fruit (*Artocarpus Indica*) is boiled when young and eaten. Different vetches and pulses, the head of the talipot palm pounded, from which a white flour is made, the seed of the lotus, &c. &c.

---

* Some take double this amount, their stomachs being very capacious.

The Brahmin, (except the Konkinees) disdaining to touch animal food, or rather perhaps having a religious aversion to it, eats his vegetables alone, and grows fat on his milk and ghee.

Before passing on to the animal food which is consumed, a few lines are necessary on another subject; *climate* has a great effect upon food; during the south west monsoon, when the atmosphere is saturated by moisture, and the rain falls heavily, the winds are strong and the earth nearly a swamp, it is difficult for the labouring population to obtain food unless of an animal kind, or *poonac,* the refuse portion of the cocoanut after the oil has been expressed (very irritating to the bowels.) Fish at this time are, unless salted, hardly to be obtained: the roughness of the sea, and the atmospheric disturbance precludes the *mucuas,* or fishermen from carrying on their occupation. Salt-fish ought to be very abundant here, but instead is difficult to be procured. The enormous Cochin fisheries appear employed for the purpose of obtaining fish-oil. A few fish are salted for Ceylon (but this is mostly effected by persons who come for that purpose) sharks fins for China, and sharks flesh for Inland. The waste of fish is lamentable.

This morning being obliged to proceed some miles out to sea on board a vessel, I counted 54 fishing boats employed, 48 of which were Ceylonese.

Unhealthy salt-fish is found in most huts during the monsoon, small sardines and the fry of other tribes are captured and soaked for a short time in the sea, and in this state dried. Many cases of visceral irritation are caused from eating these half cured fish.

It should be here mentioned that every little stream and bit of marshy ground has animal and vegetable life in the monsoon time, that is employed for human food. Immediately the rain descends, the climbing perch (*anabus scandens*) and the verrarl come forth from the over crowded ponds and moist ditches, and wander over land to fresh places, which though only containing water during the monsoon time, still are replete with food for the finny tribes—at this period the number of fresh water fish captured by the hand or in baskets is enormous, but sometimes being kept till semi-putrid become a cause of much disease. Fish as one advances inland become more irritable to the bowels when eaten, but are by no means deficient in numbers.

The lowest caste (as slaves) eat the various kinds of fresh water snails (*ampullariæ*) abundant every where, though decreasing in numbers nearer the ghauts; they are curried and eaten. Advancing inland where the ampullariæ begin to decrease both in size and number, the marsh snails (*paludina*)

become very abundant : the smaller (*paludina melanostoma*) existing nearest the sea-shore gives place to the larger striated one (*P. Bengaliensis*). The large *Potamides* (*terebralia telescopium*) is also to be seen near the coast in every wet paddy field, swampy piece of ground and mouth of river ; this is also eaten.

As the social status in the Native increases, so do his ideas of food ; ampullariæ paludinæ, and potamides, or crawling molluscs fit for slaves and Pariahs are for that reason unfit for him, unless as medicine. Still he has no objection to such other shell-fish as he can obtain, that is not quite so common and does not crawl, so he eats the fresh-water mussel (*unionaceæ*) and some of the *cardiaceæ* which are to be procured.

Such is a very brief summary of the water tribes that are eaten : sea-fish all the year round except during the monsoon time ; fresh water-fish mostly during the monsoon time. The crocodile is killed, but never eaten except as medicine.

Mutton is unprocurable except by the wealthier classes, for sheep have to be brought from the other side of the western ghauts : cows of course are not killed, in fact such a proceeding would be one of the most heinous offences in the Native state, still if any die the slaves are permitted to feed on them. This does not appear productive of disease.

Pigs are very favorite animals with the Nairs, Native Christians and lower clases for food, and are of the most deleterious description, apparently at times originating cholera, or at least persons who eat pork appear more susceptible to the onslaughts of that disease than those who abstain. The Moplahs even eat pork but under the designation of *mutton*.

The house-cat from the bazaars, the deer, the squirrel, the porcupine, and the iguana from the jungle : the flying fox and other species of bats : any birds (except raptorial ones, and a few others) even mice and frogs are eaten.

When the south west monsoon terminates, the land becomes first dry and subsequently parched up : the smaller spots of water diminish and then disappear, as do also the shell-fish : but the sea-fisheries recommence, and a fish diet becomes exceedingly cheap, the port also opens, work becomes abundant, and no able-bodied individual need be in want of food.

The north east monsoon is very slight, hardly checking work, and rarely even fishing, whilst vegetables are abundant, and rice and grains come from other parts of India in small country crafts.

Such are the most common articles of consumption. The Hindoos when eating generally drink warm water in which ginger is infused. They

eat large quantities of opium, but as a rule ganjah is perhaps less employed in this than in many other portions of India. Drunkenness is a very prevalent vice, and toddy and arrack are abundant.

The diet of the various hill tribes is here omitted, each essentially differing from the other. In some places where the yellow arrowroot abounds, that after soaking is the common food on the hills; where the sago palm flourishes it for nearly two months in the year is the sustenance of the surrounding people. The seed of the lotus is gathered for food.

Before any trustworthy deductions can be given as to the effects of diet upon the people of India, a correct census must be taken and registration of deaths rendered compulsory. Then each caste will have to be classed alone, and each age and sex be separately given.

I do not believe the Native here to be either a model of sobriety or health. He is dyspeptic and short lived. He distends his stomach twice a day to a most unwarrantable extent: he irritates it with stimulating curries and hot liquors, whilst its nervous sensibilities become dulled by the habitual use of opium, toddy or arrack. It becomes therefore no wonder that he is the victim of indigestion and visceral affections, and consequently goes early to the grave.

The convict is far more healthy than the cooly, unless epidemics attack the inmates of the jail. But it appears to me the European in his native land is far superior to both.

Appendix No. 2.

DEATHS IN COCHIN.

Year.	Number of deaths.			Average deaths to population.		
	From non-epidemics.	From epidemics.	Total from all causes.	From non-epidemics.	From epidemics.	From all causes.
1855	368	147	515	1 in 30	1 in 77	1 in 22
1856	385	21	406	1 ,, 29	1 ,, 539	1 ,, 27
1857	258	65	323	1 ,, 43	1 ,, 174	1 ,, 38
1859	358	247	605	1 ,, 31	1 ,, 46	1 ,, 18
Yearly.	342	120	462	1 in 33	1 in 94	1 ,, 24

TANJORE DISTRICT.

By Assistant Surgeon W. Doyle, M. D. F. R. C. S.

The food of the labouring population of this zillah varies according to the nature of the cultivation in different parts of the district. In the immediate neighbourhood of Combaconum rice is the principal crop, and rice may be said to form the staple food, but cumboo, mucka cholum, raggy and varagu are largely used, as they are to be had at a cheaper rate than rice. In those parts of the country which produce dry crops, rice is more difficult to procure, and its place is in a great measure supplied by the grains already mentioned. Of all these rice although probably the dearest and least nutritious is the most prized, and those who are fed on rations, as prisoners, would be very unwilling to accept any other grain as a substitute for rice. * Half a Madras measure of any of the above is considered a fair daily allowance for a working cooly, and along with it is used a little dholl or vegetables, as brinjals, plantains, &c., and according to the means or opportunity, occasionally some dried or fresh-fish ; with this is eaten as seasoning a little of the universal curry stuff composed of chillies, tamarind, salt, &c. Curd or butter-milk is taken when procurable, which is but seldom, and still more rarely a little ghee or meat is added to the family meal. This I believe comprises the principal articles in the bill of fare of the ordinary working population, or at least as much of it as the individuals are willing to acknowledge, but as far as I can learn, there is a most important and nutritious addition made to it, at least amongst the low caste people in the shape of snails, crabs, and sometimes frogs, the former especially are very plentiful and are much eaten. They are not sold in the bazaar, but they are to be had in plenty in the paddy fields from June to January, and I am told they make a most palatable as well as probably a most advantageous addition to the ordinary mess of rice, the deficiencies of which as an article of food, they in all likelihood compensate for and supply. This need not excite surprise, as snails are cultivated in some parts of France, where they are regularly fed for the table and are eaten as a delicacy in the cafes of Paris.

The cooking of any of the grains abovementioned is very simple. Rice is generally eaten plain boiled, but it is sometimes pounded and made into cakes. Mucka cholum, cumboo, raggy, and varagu is either pounded or ground, when it is boiled into a kind of porridge or baked and eaten as cakes or bread.

---

* Note.—About 1¼ lbs.—W. R. C.

The dietary scale used in the jail is below, and it will be observed that the prisoners are as well or perhaps better fed then the poor laborers in the district. The allowance of rice and condiments is nearly alike in both cases, but the meat and ghee are in favor of the prisoners. On questioning some of the convicts as to their diet, they almost if not quite admitted that it was as good as they were accustomed to, but they said they had greater variety when at liberty. None of them however seemed to like the idea of their food being more varied by substituting some of the dry grains for rice twice or thrice a week, although it is very probable such a change would be conducive to health. From my experience of this jail, prisoners of this kind require to be somewhat better fed than the laboring population in the vicinity, more particularly when the food of the people is perhaps scanty and of a poor kind like rice.

In corroboration of this I may instance the mortality of this jail, which for the three years previous to the introduction of the meat and ghee ration in July 1858 averaged above one death to $8\frac{11}{59}$ prisoners has fallen in the year ending 31st December last to but two in 111, or but one death in $55\frac{1}{2}$ prisoners, as will be seen by the following table ; at the same time it is right to observe that the jail was less crowded, and consequently better ventilated last year.

	1855	1856	1857	1858	1859	1860	1861
Average strength	164	168	164	166	219	133	111
Deaths	19	19	21	17	19	6	2
Deaths to strength —1 in.	$8\frac{12}{19}$	$8\frac{16}{19}$	$7\frac{17}{21}$	$9\frac{13}{17}$*	$11\frac{10}{19}$	$22\frac{1}{6}$	$55\frac{1}{2}$

Many causes combine to depress the health of prisoners and make them more liable to disease than the laboring population around ; the despondency arising from confinement, especially amongst those who are sentenced for long periods, the absence of instruction, and the want of mental occupation, and stimulus to exertion, all tend to produce a morbid state of mind which depresses all the animal functions and renders the body more obnoxious to disease.

To obviate this tendency, which shows itself unmistakeably in atrophy, diarrhœa and a peculiar anemic state, it is probably necessary to endeavour

* Meat and ghee given from July

to maintain the strength by a more nourishing diet than would be required by the same class of persons when at liberty.

Scale of diet now using in the jail of Combaconum.

Daily allowance for working men, 65 rupees weight of raw rice; security prisoners, 60 rupees weight; prisoners under trial, female and sick prisoners, 54 rupees weight. Each prisoner is allowed $3\frac{1}{2}$ pies daily, two of which he is able to spend on vegetables, curry stuff, &c. In addition to the above ordinary diet, each prisoner is allowed 4oz. of mutton (caste permitting) and half an ounce of ghee three times a week.

CUDDALORE (SOUTH ARCOT.)

By Assistant Surgeon H. E. Busteed.

The chief articles of food consumed in this district are the several varieties of dry grain (raggy, cumboo and tennay) rice, mutton, fish and vegetables. The different descriptions of grain are used by all classes indiscriminately. Particular castes are not restricted to any particular kinds of grain, their use depends on the social position of individuals, the poorer classes use raggy and cumboo, while the more well-to-do confine themselves to rice. The Brahmins are an exception—though not restricted by any rule of caste, under no circumstances do they use cumboo or raggy.

As a body, Hindoos may be said to be vegetarians. Some castes, such as Moodellies, Pillays, Naidoos, Pullys and Cavarays, use fish and flesh, but only as a luxury. Brahmins, Chetties, Cometies, Buthens, Jairs, Nainars, and Sivas are purely vegetarians;* they have no choice. Milk, tyre, butter, ghee and other oleaginous substances enter largely into their food. The *Sivas* are a body of Sudras, who from religious principles abstain from all animal food.

The quantity of grain each man consumes daily is from half to one measure, being equal to the weight of 80 Rupees or two pounds, and of flesh from two to four ounces. The preparation of their food by the Natives is for the most part very simple; the grain is usually boiled and eaten with curried meat or vegetables, or finely ground and made into cakes with ghee, &c.

There is nothing in the general physique of any particular castes of the people indicative of the superiority of their food to the rest. The wealthier

* This observation is evidently only intended to mean that the people are not flesh-eaters.
W. R. C.

classes, and those in whose food oily matters form a considerable ingredient, are certainly more sleek in appearance ; but the lower classes, whose food is of the simplest and coarsest description are more hardy and capable of enduring greater fatigue.

There is not any material difference between the dietary of the prisoners in jail, and of the working classes outside. The food of the prisoners consists of rice and dry grain with condiments daily, and a weekly allowance of mutton or fish. Laboring prisoners receive 65 Rupees weight of rice or 60 of dry grain, and the sick and prisoners under or awaiting trial receive only 54 Rupees weight.

By a recent order, the issue of rice has been restricted to the prisoners longest in confinement, and dry grain has been introduced. The majority of the prisoners now receive dry grain.

It is perhaps rather too soon since the change has been made to report upon its effects on the health of the prisoners ; but I am inclined to believe that the quantity is insufficient from the rapidity with which it is digested.

A more liberal allowance of animal food would, I believe, be attended with a much better health-state of the prisoners than now obtains. Mutton and fish are now issued on alternate Sundays, a deduction of $2\frac{7}{8}$ of a pice being made from each man's daily allowance (4 pies) for this purpose—the quantity each prisoner thus receives is about one ounce and one-third.

The Medical Officer in charge of the jail has the discretionary power of ordering an extra supply of meat when he considers it necessary ; but to derive the full advantage from this power, it would in my opinion be necessary to change the entire diet scale, giving animal food at least three times weekly to all prisoners.

CUDDAPAH.

By Surgeon F. Fletcher.

The labouring classes subsist principally upon the following varieties of grains.

1. Zonaloo.—Holcus saccharatus. (*Sorghum Vulgare.*)
2. Raggy.—Cynosurus coracana. (*Elusine Coracana.*)
3. Sujilloo.—Holcus spicatus. (*Cumboo.*)
4. Caraloo.—Panicum Italicum. (*Veragoo.*)
5. Samaloo.—Panicum miliaceum. (*Tennay.*)
6. Arikehloo.—Panicum frumentaceum.

Rice (*oryza sativa*) is considered a luxury by this class of people, and is used only on marriage or other festivals.

Zonaloo is a very wholesome and nutritious grain, and is much eaten by those who require to work hard and endure much fatigue in preference even to rice.

Raggy and sujilloo are very useful grains. They are reckoned less nutritious, but more delicate and of a cooling nature.

Coraloo, samooloo and arikehloo are still less nutritious,* but are favorite articles of diet among the poor classes.

Out of the above named grains, the zonaloo, raggy and sujilloo form the staple articles of food, and are therefore cultivated extensively in this district.

The majority of the working classes prepare and eat their food in the form of " sunkaty," which is made by mixing one part of bruised raggy with two of zonaloo, and the whole boiled down in a little water to a thick consistence. This is eaten usually with salt, boiled greens, and chillies, or with dholl chatney.

The Mahomedans prepare their meals of zonaloo and raggy principally in the form of cakes and eat them with dholl or vegetable curry. Animal food is not often used on account of its expense.

The quantity of dry grain consumed by each individual for three meals is from ¾ to 1 seer or 120 Rupees weight (from 2¼ to 3 lbs.)

Scale of diet allowed for prisoners in jail.

A male convict receives 70 Rupees weight of zonaloo for two meals on Monday, Tuesday, Thursday, Friday and Saturday. On Sunday and Wednesday he receives 65 Rupees weight of rice. Besides this, he receives 3½ pies for the purchase of condiments; viz, salt, dholl, vegetables and curry-stuff. On Sunday the convicts are allowed to purchase mutton out of that day's and Saturday's allowance, this will be about 4 ounces.

The female convict receives daily 60 Rupees weight of zonaloo for five days in the week, 54 Rupees weight of rice for the other two days, and also 3½ pies per day for condiments.

The prisoners in the jail, generally speaking are in good condition and enjoy good health.

---

* Dr. Forbes Watson's analyses go to show that the smaller millets here named, are the richest in albuminous principles.—W. R. C.

The laboring classes as a body are tall, robust and well formed, and enjoy comparatively better health than the higher classes, and many attain a ripe old age. It is well known that this class of natives recover in a remarkable manner from severe wounds and other injuries; this is chiefly owing, I have no doubt, to their simple and unstimulating diet. I believe that this diet is well calculated, if in sufficient quantity, to maintain health, and it is found that when it and other necessaries of life are plentiful and cheap, the laboring population enjoy good health—while on the other hand in bad seasons, disease prevails to a great extent—since being badly nourished, they are predisposed to it.

COIMBATORE.

By Assistant Surgeon G. S. W. Ogg, M. B.

The food of the laboring population in this district consists chiefly of the cereal grains, cholum and raggy. Cumboo is also used as food in some parts of the district, but in much smaller proportions than cholum or raggy, while the consumption of rice is confined chiefly to Brahmins and the richer inhabitants.

Those who can afford the indulgence mix dholl with the cholum and add a variety of condiments, such as garlic, onions, tamarinds, pepper, coriander seed, cummin seed, saffron, &c. Two meals are usually eaten daily, and the quantity consumed at a meal by a healthy adult might vary from one to two pounds of husked cholum.

The absence of variety in the diet of the inhabitants of this country, and the simplicity and similarity in the modes of its preparation render it extremely difficult from the want of all means of comparison to ascertain what effect dietic causes may have in the production of disease. There is one fact however bearing upon this point that seems to me worthy of notice. A large proportion (upwards of eighty per cent.) of the men admitted into jail are found to be suffering from scurvy, as shown by spongy, discolored or ulcerated gums.* That this affection arises in many cases from absolute destitution there can be no doubt, but as at the same time it is found frequently in men who were in good circumstances before incarceration, it would seem to point to the want of some ingredients in the food of the population necessary for nutrition. The investigation of this question might

---

* The great prevalence of land scurvy in the Coimbatore district, and the causes tending to produce it, demand attention. While in Medical charge of the zillah some years ago, I was inclined to believe that the impregnation of the drinking water with nitrate of potash, (a salt which probably tends to the undue destruction of tissue and blood corpuscles) had something to do with it.—W. R. C.

go far to determine the vexed question of the proximate cause of scurvy, and what those constituents of the blood are, the absence or deficiency of which predispose to this affection. An exact quantitative analysis of the saline ingredients of the grains used as food by the population of the district might throw light on this subject.

The diet of the prisoners in jail differs little from that of the laboring population, except in the supply of animal food, (5 ozs. of mutton) which is allowed three times a week. The mode of preparation is the same as that already detailed—a liberal supply of condiments is allowed, and care is taken that the grains issued are of good quality and properly cooked. Cholum is the grain issued to the great majority of the prisoners, as it is of most common use in the district, but raggy is given to those by whom it is preferred and who have been accustomed to its use, and rice is given to rice feeders if it is found that they suffer from the use of the other grains.

The daily allowance of food issued to each prisoner is as given below.

	lbs.	ozs.	Drs.	Grs.
Cholum unhusked	2	...	...	...
Do. husked.	1	8	...	...
Fine rice for the sick	1	4	...	...
Coarse	1	4	...	...
Vegetables	...	6	...	...
Dholl	...	1½	...	...
Salt	...	½	2	...
Tamarind	...	½	...	...
Chillies	...	...	1	...
Onions	...	...	½	...
Garlic	...	...	...	45
Pepper	...	...	...	30
Cummin seed	...	...	...	20
Coriander seed	...	...	1½	...
Mustard	...	...	...	30
Turmeric	...	...	½	...
Mutton three days in the week ...	....	5	...	...

In some cases, one ounce of ghee three times a week is given instead of the allowance of mutton. The diet of the under trial and security prisoners was reduced about a year ago; 60 Rupees weight of cholum being given instead of 80 Rupees weight, and an allowance of animal food (5 ounces) being issued once instead of three times a week. The allowance of animal

food now issued to the prisoners in this jail is almost the same as that given in the English county and Borough jails, and larger than the allowance permitted in the Scotch prisons—the weekly allowance of meat in the former class of prisons being 14-6 ounces to prisoners sentenced to hard labor, and 7-8 ounces to prisoners not undergoing hard labor, while in the Scotch prisons the weekly allowance is 10 ounces to prisoners sentenced to hard labor and 7-5 ounces to prisoners not sentenced to hard labor. On the whole I am of opinion that the food of the prisoners in this jail is sufficient in quantity and sufficiently nutritious to keep them in good health. The rapid improvement in appearance of the majority of prisoners after incarceration, plump and healthy looks of those who have been sometime in prison, and the diminution in the percentage of cases of scurvy prove that this is the case. There is one fact that would seem to militate against this conclusion, and that is the extreme prevalence and fatal character of dysenteric diarrhœa in this jail. There are however in my opinion sufficient reasons for coming to the conclusion that the prevalence of this affection is by no means to be ascribed to the nature of the diet of the prisoners, but to other causes, such as the overcrowding, deficient ventilation, and the malconstruction of the prison itself.

GUNTOOR.

By Assistant Surgeon T. Croudace.

Ordinary diets for prisoners in the jail consist of rice and cholum, with vegetables of all kinds procurable in the season.

Rice.	For prisoners on hard work....	65	Rs. weight of rice.			The rice diet is allowed to every prisoner on Sunday.
	do. do. light work....	65	,,	do.	do.	
	do. women or for prisoners without labor.	60	,,	do.	do.	
	do. prisoners under trial or sick prisoners.	54	,,	do.	do.	
Cholum.	For prisoners on hard work. .	70	Rs. weight of cholum.			This diet is given on all days from the time of imprisonment.
	do. do. on light.	do.		do.	do.	
	do. female prisoners or prisoners without labor.	65	,,	do.	do.	
	do. prisoners under trial or sick prisoners.	60	,,	do.	do.	

Vegetables.	Gongoora, cucumbers, brinjalls, bandakois. Country beans, beerakais or thoorys, thotakoora, &c.	These when procurable are prepared for curry according to choice with proper condiments.
Grains.	Kundooloo pasaloo.	

Procurable at every season and used as other vegetables in the shape of curry with rice and cholum. The grains are broken at first by grinding and freed from skin by proper means, and then boiled with a due proportion of salt and water until the whole attains a soft consistence.

The above is also the usual food of the population, except that they do not restrict themselves to any specific quantity—some castes use animal food in addition.

Beef is used by Mahomedans, Pariahs and Chucklers.

Mutton is used by Teloogoos, Tamil and all other castes.

Pork is used by some of the Teloogoos and Tamil, and other low castes, excepting Mahomedans.

Cholum is the staple food of the people in this district, and is very nutritious and much cheaper then rice. When used by those who are unaccustomed to it, it causes diarrhœa (and irritation of the skin in some) but I have had no opportunity of prolonged observation of the effects on general health.

HONORE.

By Assistant Surgeon A. E. M. Ross.

The food of the inhabitants of North Canara.

1st of the Christians.—The food of the Christians of North Canara, whether of Portuguese or of purely native descent takes as wide a range as regards material as the produce of the country and the means of individuals will admit. The wealthier classes in every thing follow almost entirely the European modes. The poorer have perforce and not from sect laws to content themselves with a vegetable, or vegetable and fish diet, such as is used by the lower Hindoos, butchers meat being seldom obtainable by them. Fish, on which the poorer, especially the *Native* Christians almost entirely live, are abundant, save during the monsoon, and of good quality. The most common are the seer-fish, the pomphret, the mullet, the sardine and others.

A full account of this diet and its effects will be found in the consideration of the food of the lower Hindoos.

The moderately well off among the Christians, such as Government clerks, are very fond of pork, and almost every family keeps two or three pigs; poultry is dear and scarce; the same may be said of beef and mutton, which indeed is hardly procurable, so that animal food, saving fish, and occasionally pork, is rather scarce among all except the wealthier classes of the Christians. Very general use is made of tea and coffee, and the morning and evening meal are taken in the European style, which is also the mode of cookery adopted. No sect or other rules prohibiting the use of intoxicating liquors—these are indulged in openly though never in one instance in my experience to excess. Among the lower classes, toddy and arrack are used, among the wealthier the European beverages.

Much remark need not be made here on the effects of the diet of the upper class Christians, as it so very nearly resembles that generally in use among Europeans in this country. It seems excellently well suited to the people, who as a rule are very healthy and strong, and not subject especially to any of those diseases which are supposed to arise from a meat (or stimulating) diet, as it is thought to be in this country.

On the other hand they are protected seemingly from many of the diseases and their sequels, which affect in a considerable degree the other people of this district. They are not nearly so liable to the diseases of digestion, such as obstinate constipation, flatulence, colic, atonic diarrhœa, &c. which we shall find prevail among the Hindoo classes, nor do they so readily succumb to the prevailing fevers and their results. They do not so soon experience the decay of age as the people who live on a less nourishing diet. It may bear somewhat on the question that they seem to be invariably *moderate* in their appetites.

They are generally well-housed and otherwise comfortably provided, which of course has considerable influence in securing them from the common diseases of the district.

Food of the Hindoos of North Canara.

1st of the Brahmins.—The more sacred the caste to which a brahmin belongs, the more strictly vegetable is the nature of his food; saving always milk which is extensively used as an article of diet even among the highest castes.

The most religious among the brahmins even reject a vegetable called pudvolu as an article of diet, because they suppose it to be closely allied in nature to animal food.

The food of the brahmins consists mostly of rice (oryza sativa), raggy (eleusine coracana), javarrie (holcus sorghum), and other cereals which constitute the bulk of their meal, to which are added generally dholl, (cytisus cajan), chenna or chick pea (cicer arietenum), bhagee, native greens (amarantus oleaceous), the native bean (dolichos lablab), green plantain (musa sapientum), (which rarely constitute the bulk of the meal) the different kinds of pumpkin carala (momordica charantica) used in curry, brinjalls (solanum melongena), bendakai (hibiscus esculentus), and other vegetables of the same kind. Pungent aromatic condiments are very freely used, and to an extent that would be quite inadmissible in any other (such as a meat kind) of diet. The curries are made very hot, and pickles (especially limes) and chatnies are also called in to give a greater zest to every meal.

Ghee (clarified butter) is very freely used in their cookery, according to the means of the individual ; milk or curds form a large proportion of the diet, the average quantity taken being about a quart of milk daily.

Fish is sometimes eaten by a few of the brahmins only, however in the form of a relish and then privately, as strictly speaking, it is against caste rules.

Drinking is also strictly against the caste rules, but it is indulged in privately by many ; toddy, arrack and palm wine being used by the poorer ; European wines and spirits by the richer classes.

The brahmins chew betel and tobacco extensively.

The meals are taken three times a day generally. Rice-conjee after the morning bath. A principal meal about noon, and another between the hours of 7 and 8 P. M.

The quantity of raw rice, raggy (or whatever grain may constitute the bulk of the meal) used daily is about 100 to 120 rupees weight, *i. e.*, 2½ to 3 lbs. exclusive of the vegetables, which act the part of side dishes or second course. Dholl, gram, &c. also are merely used in small quantities (2 or 3 ozs.)

Altogether it is quite astonishing to one who has been accustomed to live on animal diet, and has been surrounded by others who did the same, to see for the first time what an immense quantity of rice, &c., a brahmin or other exclusively vegetable feeder will get through in one meal. It may even

be noticed from its effects; the circumference of a brahmin before and that immediately after a meal being in general very different things.

The cookery of a brahmin's food is very simple as a rule. The rice or other grain is boiled well or ground and made into cakes, generally the former is served on plantain leaves or brass dishes. It is then mixed with curry stuff made very hot (consisting of chillies, coriander seeds (black pepper seldom) a little scraped cocoanut to flavour it; rice-flour or cadalays, tamarinds and onions with plenty of ghee or cocoanut oil, and eaten in a primitive way with the hand.

Vegetables are always curried, but they are prepared in three ways, either as mulligatawny, dry curry, or fried.

The liquid curry or mulligatawny: The vegetables are cut in small pieces, put into a little water and allowed to boil until they become soft. The curry stuff prepared as above is then added with more water, and the whole is boiled again finally. Ghee or cocoanut oil, in which mustard seeds have been fried is added liberally, and the dish is ready.

Dry curry is prepared in much the same way, but water is not added with the curry stuff.

Fried vegetables are not boiled at all, but are cut into slices, smeared over with the curry stuff and fried in ghee or cocoanut oil.

As I before mentioned, the vegetables (popularly so called) form the second course.

The above directions I had almost said contain the whole essence of the brahmin's cookery book. Such is not the case, however, for they are skilled in the preparation of sweets (composed of sugar, milk, almonds, dates and so on) into the mysteries of the preparation of which I have not yet been initiated, but of which the brahmins and hindoos generally partake largely; especially on the occasion of feasts and festivals. Milk is drunk with their meals, *au naturel,* or as butter-milk or in the form of curds—of which, as a rule, the people are fond, regarding them also as cooling—the quantity taken as an average may be said to be two or three quarts.

We now come to the consideration of the effects of such a diet on the health and well-being of the people.

Rice, the general bulk of the brahmin's diet, is of all other foods nearly the most destitute of blood-making, *i. e.,* of azotised elements, but it is on the other hand rich in the hydrocarbons. One other class of men I know,

our poorer Scottish peasants live on an almost as exclusively vegetable diet, but the staple of their food is oatmeal, which is widely different in its nutritious value from rice, (oats according to Fromboy ranking as 75, rice as 35) and it is used in a very different climate, where hydrocarbons are needed to support the animal heat.

It has chanced to me of late to read the works of many authors on the health of Europeans in the East Indies, and the rules therein laid down for the preservation of it.

Among these I find two almost invariably expressed.—1st, " to live as much as possible on a vegetable diet, such as the Natives use," to prevent unnecessary heating of the system, and subsequent over-action of the eliminatory organs. For the same reason, rule 2nd, " the avoidance of alcoholic drinks" must be adhered to.

Now, a vegetable diet such as the Natives of India (Hindoos) use is essentially and typically a hydrocarbonic one, closely allied in elemental composition, in all essential particulars to alcohol, yet the former is an article of diet advocated, the latter is condemned. With both however a surplus of hydrocarbons is taken into the system, and that excess together with that resulting from the natural waste of the tissues must be eliminated by the lungs and other organs. But this very act of elimination gives rise to the production of heat, which it is our aim as far as possible to suppress. In fact, we find the Hindoo people of India adopting a form of diet (for as stated, they use much ghee and oil with their already carbonaceous food, rice) which we approve, and which Nature shows us is right in the inhabitants of the coldest climates, (Lapland, &c.) but Nature endeavours to correct the errors of her children. In most cases, she instead of causing the elimination of the entire hydrocarbon taken in the food permits it to be stored up in places where it will interfere as little as possible with the animal economy in the form of fat, and persons subject to this condition are, as a rule, and to a certain time the healthier.

Again, it is evidently the design of Nature that the waste which takes place in the animal frame should be replaced with so much of a proper material as will suffice, (I speak of the adult*) for if there is too much material either as regards actual quantity of a proper food, or a redundancy of useless matter in the diet (*i. e.*, matter which cannot be assimilated and put to needful use in the economy) an additional burden is thrown upon the efferent, or

* As in the young, material must also be provided for growth.

excretory organs, inasmuch as they have then not only to get rid of the effete, degenerate, or degraded matter thrown off in every action of the animal system, but also of a quantity of material which was not used and not required in the animal economy.

Now rice and allied grains contain but a small proportion of proper nourishment (azotised materials) ; a large bulk of them must therefore be taken to supply the quantity of material needed. This gives *Nature* the trouble both of separating the material she needs from a great bulk, and afterwards of getting rid of the matter not required.

Again, rice is an unirritating kind of food, and a certain proportion of irritating material is needed both to stimulate the action of the stomach, and through a like effect to regulate the action of the intestines.

We have hitherto been considering the food of the Brahmin typically, *i. e.*, as consisting of rice, which indeed it does very nearly, but experience has taught him that it alone will not support life. The rice is accordingly aided by a very small proportion of chick pea (cicer arœtinum), dholl (cajanus indicus), the Native bean (dolichos lablab) or some such material rich in azotised or sanguineous elements. This however in very small quantity, say two or three ounces in the day. The other vegetables taken serve in some manner to add that irritative material to the diet necessary for good digestion, but these are not taken in sufficient quantity nor are they always of a proper kind. Their purpose therefore is aided by the use of curries and hot aromatics to a very great extent, such as could not be indulged in with a more irritating food.

So much for the theory, and now for the actual state of things observed.

We would expect from what we have considered to find the brahmins ill-nourished, and also from the carbonaceous nature of their food, of higher bodily temperature, and more affected by the heat than those who live on a more nitrogenous diet.

And such we find to be actually the case in this district at least. The brahmins have no bodily strength, indeed they never attempt any muscular exertion, leaving that entirely to the lower classes. They are very apathetic, they fall readily before disease, and are subject more than others to the diseases of insufficient nutrition. The standard of age is low.

That they feel the heat more than others is evident. They could not sustain European clothing, but are clad in the lightest garments. They shun the sun-light and bury themselves when they can in rooms from which it is entirely excluded. During those hours of the day when the heat is greatest,

all business is suspended among them, when practicable (such as among tradesmen, the bazaars are shut for two or three hours in the heat of the day) and they then become drowsy, oppressed, and unfit for all exertion. Fevers run higher and finish their course sooner in the case of a fatal termination in them than others. This I will notice especially further on.

In consequence of the quantity of irritating curries, &c., used with their food, and owing also to the unirritating nature (mechanically) of their food itself, the Brahmins (and the remark applies, as do also the others, to all who live on a similar diet) are specially liable to extreme and distressing flatulence, and obstinate constipation, colic, &c., as also to a very irremediable form of subacute gastritis.

These various forms of indigestion are increased by the continued and noxious use of betel and tobacco which are very commonly and extensively chewed.

THE FOOD OF THE BRAHMINS AND ITS RELATIONS TO MIASMATIC FEVERS, WITH SPECIAL REGARD TO A CERTAIN THEORY.

Of all the diseases of this district, miasmatic fevers are the most prevalent and fatal, the deaths from them amounting as far as can be ascertained to more than those caused by all other diseases together. During the past year the district has been decimated, some villages more than decimated by these fevers, which have been during that time, owing to certain causes which might in a great measure be removed, specially prevalent.

Whatever therefore tends to throw light on the prophylaxis or cure of this malady is worthy of consideration.

Intermittent fever is caused by the action of a malarious poison acting primarily, some think, on the blood, others on the nervous system.

I believe the former. I believe that the malarious poison is allied to the hydrocarbons, that having entered the blood in what special manner, or through what particular channel, if there be such I am not prepared to say; that having entered the blood it undergoes a fermentation or multiplying generative process; that on the rapidity of the fermentive or other cumulative process of the poison, it depends whether the fever shall be quotidian, tertian or quartan or other variety.

The poison may enter the system in the form of a minute fungus, capable of rapid propagation such as the *sarcinæ*. Fungi, as we know produce rather than decompose carbonic acid.

However this may be, I believe that the result of the malarious poison, after the period of incubation is past is the generation of hydrocarbon in the blood. This acts as a depressant on the system, which not being at first able to rally ceases to work, and the excess of carbonic acid as it is generated cannot be thrown off from the lungs. In consequence of the same also, combustion not going on in the lungs to a necessary extent, the temperature of the body becomes much depressed, and ague is established.

The system at length rallying under the pressure of great necessity, the hydrocarbon generated by the poison begins to be burned off with rapidity and increased heat, or fever is the consequence.

The tonicity of the vessels natural to a state of forced circulation at last diminishes as the fever becomes less (*i. e.*, as the rapidly diminishing hydrocarbon in the blood no longer necessitates so forced and rapid a circulation to get rid of the surplus) and the third stage of an intermittent fever is established, and the free perspiration completes the work which the quickened circulation and consequent quickened combustion began.

So it goes on. The poison germ, if not destroyed entirely in the first paroxysm, again after lying latent for a time begins to generate its carbonic product and the same result follows.

If Nature or art, or both tend to overcome the disease, the germ gets exhausted more and more in each successive paroxysm, if not it gets more powerful—the cold stage becomes longer, in consequence the blood is not purified again by the same combustion, (giving rise to fever) and the patient dies poisoned by the miasm. His blood is carbonised.

The hæmatine of the blood must of necessity be oxidised, if not it degenerates and becomes disintegrated, as the iron in it can no longer remain in the state of oxide.

The facts which I bring forward to support this theory are the following :—

1st.—The blood of those who die in the cold stage, or before the fever stage (or reparative process) has cleared away the hydrocarbon generated ; is dark and fluid, presenting much the same appearance as that of those who die by asphyxia, carbonic acid poison in a very minor degree externally applied. The symptoms are also frequently the same though in a less degree.

2nd. As the disease advances to a fatal termination, the cold stage becomes longer, the stage of combustion shorter, or the germ or miasm generates so ersistently as to require a very prolonged fever stage to get rid of it.

3rd.—When the intermittent fever has lasted for some time, the blood not having had time to be thoroughly and properly oxidised, the patient becames anemic, the blood-making process goes on more slowly, though Nature feeling a necessity for more, and the spleen being unable to elaborate sufficiently quickly the blood which comes to it, becomes congested and enlarged.*

If this theory be true, we would find people who live on a carbonaceous diet, such as the Brahmins use, specially liable to ague, as such a diet predisposes to the state induced by fever : and such is the case in this district at least. The carbonaceous feeders are not only much more liable to ague, but are also more severely attacked by it, and the mortality among them is infinitely greater in proportion than among those who live on a less carbonaceous and more proper diet. Europeans and those who adopt a European style of diet have been left almost altogether free from the epidemic of ague, which at present is decimating the Hindoos in this district. *When* they *are* attacked, the complaint is comparatively very slight and easily overcome.†

THE FOOD OF THE HINDOOS IN GENERAL.

The diet of the upper class Hindoos much resembles that of the Brahmins both as regards quality and quantity.

The Jains, (1) Lingayets, (2) Malvurs, (3) Charodys, (4) Bundicars, (5) Sougars or Goldsmiths, (6) and Ironsmiths, (7) pretend to live entirely on a diet similar to that of the Brahmins, but the Sougars and Ironsmiths, and perhaps the higher castes also eat fish, though not to any extent, and privately.

The Carpenters (8) live on both vegetable and animal food (except beef.) The vegetable part of their diet is similar to that of the Brahmins. The animal food they take does not amount to more than two or three ounces in the day. They drink toddy and arrack.

The Goodgars (9) are vegetable feeders, and live on a diet similar to that of the Brahmins, they also indulge in an ounce or two of fish now and then.

The Mudvars, (10) live on vegetable and animal food, except beef, as also the Sherogars, (11) Ganavackloos, (14) Halakys, (15) Bhundarys, (16) Comarpikis, (17) Hallipikis, (18) Canbalipikis, (19) Nadguis, (20) Cawys, (21) Waddars, (22) Curryvackloos, (23) Hoopars, (24) and Coobars, (25.)

* The beneficial action of chlorate of potash is easily accounted for, if this theory be correct.

† This not being a strictly Medical report, I have not said so much, and consequently have not advanced so much in support of this as I would have wished to do.

The Chucklers, or Shoemakers, (26) Cheloadys, (27) and Hoolsavars, (28) live on any thing, without exception that contains nutriment. Dead animals do not at all come amiss to them, indeed they are as a rule too poor to afford any other kind of animal food, of which they are particularly fond.

The Dhees, (29) the most numerous class of agricultural, (laborers) Moguers, (30) and Mahrattas, (31) live on both animal and vegetable food with the exception of beef.

All the Hindoos below the Ironsmiths (7) eat fish, which being the cheapest kind of animal food procurable in the district is that most generally used. It is not however taken in very large quantities, (seldom more than half a pound) and is prepared generally in the form of curry. The fish is usually dried or salted before being used as food. When cooked as curry, the fish is broken up into pieces and boiled with the curry stuff in a little water, until it is judged sufficiently cooked, when it is mixed with rice separately boiled and eaten.

It is sometimes fried in ghee or cocoanut oil or other oil, always however with the addition of chillies or other hot condiments.

Sometimes the fish is cooked by being simply thrown when fresh into the embers of the fire, when done, the skin is peeled off, as then may easily be effected, and the meat eaten with the never-failing rice.

The vegetable part of the diet is the same as used by the Brahmins, but the quantity of rice or grain eaten seldom exceeds one seer or 80 Rupees weight daily.

The average cost of this diet here is, rice 1 seer, 1 anna, fish two or three pies, condiments (*i. e.*, coriander seed, cardamoms, chillies, &c.,) 4 or 5 pies.

Betel and tobacco are generally used among the Hindoos, and the lower classes also drink toddy (the fermented juice of the shoot of palm tree) and arrack. Dhees, Moguers, Mahrattas, and other low castes are specially addicted to indulgence in these intoxicating beverages.

THE EFFECT OF THE DIET OF THE HINDOOS AS REGARDS HEALTH AND DISEASE.

The diet of the higher castes of Hindoos, viz., Jains, Lingayets, Malvers, Charodys, Bundicars, Sougars and Ironsmiths being much the same as that used by the Brahmins, the observations made regarding the effect of that dietary will serve for them also.

Fish is eaten sparingly among the next higher classes, and not in sufficient quantity to produce a marked specific effect, but in the lower classes who use it more freely, a fish diet undoubtedly gives rise to Malabar itch, not only a painful, but also a rather intractable complaint. The Natives themselves have an idea that a fish they call "kutternah" or cat-fish is specially likely to produce this complaint, when eaten even in small quantity.

The fishermen who eat freely of the produce of their own labors, but who are engaged in free labor on the sea and in the sea air do not seem so subject to the malady.

The fish eaters are also liable to a peculiar form of diarrhœa of indigestion, closely resembling cholera; often in its external symptoms (cramps) rice-water evacuations, &c., and often like that disease fatal, though not so frequently.

It is distinguished from cholera by there being no suppression of urine, by the eyes not being so sunk, nor the pulse so low, even in the latest stages of a fatal case. Death is by asthenia, never by coma.

The lower classes of all are they who eat most freely of animal food, and who have the hardest labour in the open air, and they are generally hardier and less liable to disease than the others, although they are of course worse housed and clothed than those who are wealthier, and whose serfs they are. The Dhees and Mahrattas may particularly be noted as hardy races, exposed to all the worst malarious influences in the district, and yet healthy to a wonderful degree.

DIET OF THE MUSSULMANS.

The Mussulman's diet may consist of any material, save the flesh of the pig. The wealthier classes of course can indulge in more animal food than the poor; indeed the animal food of the latter (or such at any rate) of them as live near the coast, it consists like that of the lower caste Hindoos, principally of fish. Rice though used as an article of diet by the Mahomedans is not eaten to such an extent as with the Hindoos.

When it is eaten among the wealthier classes, it is principally as an adjunct to the animal food, rather than as a distinct article of diet. Indeed it may be said to fill the same place as bread or potatoes with us. The quantity taken is about the same as among Europeans in India, when in the same circumstances. Gentle aromatic, rather than hot condiments are used by the Mussulmen. They are addicted to indulgence in bhang, betel, &c. They drink coffee freely.

The cookery of the Mussulmans is more complex than that of the European. Elaborate cookery books are printed in the Hindoostani, Persian and other languages, so voluminous, that it would take very many pages more than can be afforded in a report such as the present to give even the merest synopsis of one of them.

The Mussulman's dinner consists of several courses, a State affair given by a wealthy man exhibiting far too many dishes to be even enumerated here. In order to give an idea of an ordinary dinner of a well-to-do family of this class, I will endeavour to write out a bill of fare derived from a reliable source, with the mode of preparing some of the various dishes.

Ash Sungshere.—Prepare 1 seer each of mutton, tyre (curds) and milk, $\frac{1}{4}$ seer of ghee or melted butter, $\frac{1}{8}$ seer of rice, 2 tolahs each of white chenna and blanched almonds, of onions, carrots, pumpkins and bhagee (greens) $\frac{1}{6}$ of a seer of cardamoms and cloves, 1 masha each, coriander seeds, green ginger, and salt two tolahs each, cinnamon and black pepper 1 tolah each.

The meat and onions are cut into slices and fried in some of the ghee, the chenna is then rubbed up in a little water, and the whole is boiled until the meat is cooked. The gravy is then strained off and the meat is fried in more of the ghee with the ground cloves and coriander seeds. The whole is then boiled in a saucepan with the milk and curds, the rice, spices and vegetables are gradually added, the almonds are separately fried, then mixed with the other ingredients, and the whole finally cooked slowly until very much done.

Briame Noormahalee.—Cut one seer of meat into slices, rub them over with two or three tolas weight of salt and a little green ginger, then soak them in $\frac{1}{4}$ seer of tyre for an hour, fry $\frac{1}{4}$ seer of onions in $\frac{1}{16}$th of a seer of ghee until they are brown, then put in the meat and fry it a little; pour over the whole a little water in which one masha of coriander seeds have been ground, then boil until the water is dried up, add one masha each of cinnamon, cloves, cardamoms, haldee and coriander seeds, boil $\frac{3}{4}$ seer of rice in a little water and add to the meat, colour one $\frac{1}{4}$ seer more with saffron, put with the rest and cover all with $\frac{1}{8}$ seer of green chenna dholl, pour one $\frac{1}{16}$ seer of ghee, cover close and cook over a hot fire for an hour or an hour and a half.

All the other dishes are made up equally complex in principle, each generally containing a little of every thing.

They all contain some aromatic substance, the most of them also contain tyre or curds.

The Mussulman curries are not generally so hot as those used by the Hindoos, cakes made of powdered dholl, or other flour and seasoned with assafœtida, salt, black pepper and other spices, beat very thin, dried and fried in ghee or grilled, are generally eaten with curry.

The bread and cakes eaten by the Mussulmen are generally heavy and rather tough-leavened.

The sweetmeats of which they are very fond, and of which they eat a large quantity are composed of a great number of ingredients, and have to go through many processes in the course of preparation.

A bill of fare of dinner of a moderately wealthy Mussulman would probably include one or two *ashes* (such as the one for which the recipe is given) one or two pillaus, one or two briames (which partake of the character both of the pillau and of the curry, of which the Noormahalee is an example) two, or three kinds of curry. Beef, mutton, fish or egg with popdoms or thin cakes and numerous dishes of sweetmeats, the whole washed down with sherbets or plain water.

Effects of this diet.

As a general rule the diet of the Mussulman is one much better suited to the inhabitants of tropical climates than that of the Hindoos.

The Mussulmans are infinitely more energetic in body, are less liable to miasmatic disease, and succumb to them when attacked with much less readiness.

It is true that the communities of Mussulmen are more liable to epidemics of small pox than the Hindoos;* that however is not on account of their diet, but because of the filthy state in which they generally keep the neighbourhood of their houses, all garbage and sweeping being apparently merely thrown from the house door.

From the data, though imperfect as yet which I have gathered, I am led to the opinion that Mussulmen are as a race longer lived than the Hindoos, and that they age much slower.

The Mahomedans of this district are not liable to any diseases for which their diet may be blamed, except perhaps rheumatism. They are not nearly so subject as the Hindoos to colic, constipation, and chronic gastritis.

* This is not true of every native community. In Madras for instance the Mussulman's suffer less than the Hindoos from small pox.
W. R. C.

DIET OF PRISONERS IN HONORE JAIL.

There are three scales of diet for the prisoners in Honore jail, viz., 1st, that for men on hard labour; 2nd, that for men on light work and 3rd, that for men in hospital, for females and for men wholly unemployed.

1st.—The diet for men on hard labour.

The allowance of a prisoner on hard labour is Rupees 65 or $1\frac{1}{2}$ lbs. weight of raw rice daily with 4 pies per day, money allowance for the purchase of fish and condiments. I had the condiments of a man on hard labor weighed and enumerate them here as a good sample of the general run, both as regards material and quantity. Dholl $\frac{3}{4}$ oz., salt 5 drachms, tamarind 7 drachms, onions 40 grains, garlic $1\frac{1}{2}$ drachms, coriander seeds 3 drachms, turmeric 1 drachm, chillies $2\frac{1}{2}$ drachms, cocoanut $3\frac{1}{2}$ drachms. When they purchase fish or additional vegetables they have of course a diminished quantity of the condiments.

The food is prepared in messes, the rice is simply boiled, the condiments are then ground together with a little water boiled and mixed with the rice before being eaten. Fish or vegtables when eaten are prepared as mentioned in treating of the food of the Hindoos.

The meals are two in number, viz., at $\frac{1}{2}$ past 6 oclock, A. M. and at 5 P. M.

2nd.—Men on light work get 60 Rupees weight of rice and a money allowance of $3\frac{1}{2}$ pies for the purchase of condiments, &c.

The food is prepared as above. The condiments are much the same in quality but less of course in quantity.

3rd.—The third class 45 Rupees weight of rice daily with $3\frac{1}{2}$ pies for the purchase of condiments, &c.

The food is cooked as above.

EFFECT OF THIS FORM OF DIET ON THE PRISONERS AS REGARDS HEALTH, &C.

I believe the quantity of food allowed in all the classes as above stated to be too small for the requirements of the prisoners. It is also deficient in quality, *i. e.*, in the proper elements of nutrition for the support of perfect health.

I believe it to be brought now as low as is possible without very markedly disastrous consequences.

When we consider that the work of a prisoner on hard labour (who was perhaps also not accustomed to labor before) considerably exceeds that of an

ordinary cooly, and that his diet is not much more than half in quantity and much inferior in quality, we at once see that as regards diet, he is placed in a disadvantageous position.

As a sample of the hard labour of this jail I may mention that the men were lately employed in carrying blocks of laterite to build a new pier, seven trips each of two miles (*i. e.*, to and from the quarry each way a distance measured one mile) were made in the day, and half of each trip (*i. e.*, from the quarry to the pier) each prisoner carried a weight of stone amounting to nominally 78 lbs., though in reality rather less.

Walking fourteen miles a day in chains, and carrying seven of these miles a weight little less than 78 lbs. is indeed hard labour in this climate.

It has been argued that coolies have done as much, and I have known them carry heavier weights even a greater distance in one day; but the coolie has not to undergo this hard labor day after day, month after month for years, with only one day's rest in the week, and on so low a scale of diet.

There is too little variety in the prisoner's food. I think any other grain alternated with rice would prove a beneficial change, and this change would be rendered further beneficial if a certain quantity of some common vegetable were substituted now and then for an equivalent portion of the rice or other grain.

Prisoners, a few days after admission into the jail are liable to anasarca and other symptoms of general and nervous debility, without organic disease, due, I am of opinion as well to the sudden lowering of their diet, as to their being set at work without preparation, much harder than they have been accustomed to. I have noticed that the Mussulmen are much more liable to this affection than the Hindoos, and the wealthier than the poorer classes. A little change to a more nourishing diet and slight stimulation generally remove this condition.

Scurvy and scorbutic rheumatism, and diarrhœa are common among the inmates of the jail after the rains. A change to a more nourishing form of diet, and above all the addition of 1 pint or 1½ pint of toddy (fermented palm juice) daily I have found by far the most efficacious remedy in these cases, with such medicines as chlorate of potash, &c. as act more immediately on the blood.

At times, irremediable cases of asthma occur, especially in prisoners who have either just entered, or have been long in jail, a result of the combined hard work, and insufficient diet. Cases of dropsy, (not dependent

on organic disease) not uncommon are wonderfully benefited by a more nourishing diet. Under this treatment alone the accumulation of fluid rapidly disappears, and I have always trusted to it, and always successfully even in advanced cases, where the pressure of the fluid interfered with the breathing to some extent, as I believe that the sudden removal of that pressure by operation only increases the relaxed state of the abdominal vessels.

No other diseases have come under my notice in the jail, which could fairly be attributed in whole or in part to an improper dietary.

The prisoners, as a rule especially when not overworked are very healthy, a result which must however be attributed to the climate, the effects of which a rather insufficient diet and the worst possibly constructed jail cannot entirely mar.

TOWN OF MADRAS.

By Surgeon W. Aitkin, M.D.

The native population of Madras is a mixed congregation of representatives of all the people of southern India, Hindoo and Mahomedan, and from all ranks both the industrial and labouring ranks are now freely recruited.

Formerly, caste regulations on the one hand, and prejudices as strong as caste on the other restricted both sections of the community in their pursuits and occupations as well as in their mode of living ; but in later years these obligations and hinderances have been so relaxed and overruled, that now there is almost no obstacle to any individual choosing the pursuit which may be most congenial to him, or to his indulging his inclinations and desires without fear of social disability, except in the one case of his eating and associating with Europeans.

The removal of these restrictions has been partly due to the march of improvement and civilization, in greater degree however to motives of self-interest, awakened by the opening of new fields for industry and exertion, offering higher remunerative rewards than had ever previously been the case.

With these great social changes, increased prosperity has also produced a corresponding change and assimilation in the style of living of all classes, so that remarks which would formerly have been applicable to particular sections only, are now of general application ; the differences which exist depending entirely on the circumstances of individuals.

The change in the style of living, as might have been expected has not to any important extent affected the great staples of the diet roll. Rice, raggy, cholum, cumboo and other grains still holding the chief place in it, although meat and other varieties of food are more freely and generally used than formerly.

The diet roll of all classes including those who are said to refrain from animal food is pretty comprehensive, and affords ample room for gastronomic indulgence. Milk, butter, ghee, sugar, eggs, and fruits, allowing of combinations with the farinacea sufficient to impart both nourishment and energy to the system, as well as gratification to the palate.

The ancient custom of preparing the food for mid-day and evening meals is still the rule with all classes; what remains from the latter being kept to be eaten cold before going to work the following morning.

Rice is the article in most general use as the principal portion of meals, from the supposition of its greater suitability to an urban population with their in-door and comparatively sedentary habits; raggy, cholum and the other grains being more rarely used, except by the poorer and more laborious classes who enjoy keener and more vigorous appetites, and require stronger food which these have the reputation of being.

About 1½ lbs. or half a measure of rice is considered sufficient to afford with a proper proportion of curry and condiments an ample meal for an ordinary adult. Those however with larger appetites especially if engaged in laborious occupations, can it is said with satisfaction, although I am afraid it can hardly be with comfort considering the bulk, get through double the quantity.

The proportion of curry made of meat, fish, or vegetables is from an ounce or two to about eight ounces on an average, and either with, or in lieu of it when it cannot be obtained, from one or two ounces or more of chatney or pepper water.

Rice after washing, to separate sand and other extraneous matters is prepared by immersion in boiling water, and decoction from about twenty minutes to half an hour, after which it is strained and slightly cooled.

Raggy, cholum, and cumboo are prepared by grinding with water in a large stone mortar, after which the resulting material is boiled to the consistence of dough, from about 2½ to 3 lbs. of which is considered, on account of their supposed greater nutritive properties, sufficient for a meal with the addition of chatney or pepper water only.

Wheat and its preparations are used only to a limited extent and amongst particular classes, such as the Brahmins and Goozerat Brahmins, the latter class being chiefly employed as bankers or soucars. They make the flour into cakes with water and sugar and fry them in ghee. About $2\frac{1}{2}$ or 3 lbs. being consumed for a meal; European bread and biscuit are but little used.

The food of the Native population seems in every way adapted to the climate and their constitutions, as the generality are hardy, active, and capable of undergoing considerable and continuous exertion, and the average duration of life seems nearly the same as it is in other countries. Indeed, were it not for the ravages of endemic and epidemic diseases, springing in most instances from removable causes, there appears little reason for supposing that the expectation of life would not be as great as it is elsewhere.

The bulky and unconvertible nature of a large portion of the food together with the constant combination with ghee and acrid stimulants, leads as might be supposed to gastro-intestinal derangement in various forms, of which dyspepsia is the chief. These seldom seem however materially to affect the comfort or general health, or to predispose to serious disease.

DIETARY OF PRISONERS IN THE PENITENTIARY.

The subjoined diet tables show the daily allowance of all classes of prisoners in the Penitentiary.

The allowance to Europeans and East Indians is liberal, and in accordance with the style of living of the same classes outside.

The diet of Native prisoners is equally liberal, and is much better both in quantity and quality than can be obtained by the same classes outside as the generality of prisoners are drawn from.

The diets as shewn in the tables are, I believe, fully adequate to the maintenance of life and health under ordinary circumstances, but with few exceptions the result is otherwise in the Penitentiary. This however, is not, I think, to be attributed to any deficiency either in the quantity or in the nutritive properties of the food, in both of which respects it is perfectly unobjectionable, but to mental despondency and the want of cheerful employment and associations.

The generality of Europeans and East Indians began to fall out of condition after three months' confinement; their appetite and digestion fail; their health and spirits suffer, and a change of diet from time to time becomes

necessary to enable them to drag through the period of imprisonment. Dyspepsia in its various forms, and a tendency to scorbutic affections appear to be the only diseases which a prolonged incarceration developes in them.

Native prisoners, on the other hand, generally improve during short confinements, and it is seldom until the close of the first year deterioration becomes very apparent. After that they become subject to gastric and internal derangements, on which occasional attacks of rather untractable diarrhœa supervene ; and as they fall out of condition, itch appears to be developed spontaneously; the cessation or increase of this affording a pretty fair indication of improvement or decline in health.

With some trouble and attention to variation of the diet, the generality manage to get through the second year, but after that the deterioration becomes rapid ; they become languid and apathetic, atrophy of all the soft tissues ensues, and some one of the attacks of diarrhœa eventuates in unmanageable chronic dysentery to which they succumb.

DAILY ALLOWANCE FOR EUROPEANS AND EAST INDIANS.

Bread...	16 oz.
Beef (4 times a week)	12 „
Mutton (twice a week)...	12 „
Soup ... ... pint	1
Rice	$2\frac{3}{4}$ „
Country greens, (or vegetables as are in season)	3 „
Milk ... ... drams	4
Sugar...	$1\frac{1}{2}$ „
Salt	$\frac{1}{8}$ „
Pepper	$\frac{1}{10}$ „
Onions	1 „
Mint and parsley	$\frac{1}{8}$ „

DAILY ALLOWANCE FOR NATIVES.

For Breakfast

Rice (raw)	$\frac{1}{4}$ meas. or $\frac{3}{4}$ lbs.
Dholl chatney	$\frac{1}{2}$ oz.
Pepper water	6 „

(Made of pepper, tamarind, salt and chillies.)

For Dinner.

Rice (raw)	meas. $\frac{1}{4}$ or lbs.	$\frac{3}{4}$
Mutton, fish, or salted-fish,...	2	oz.
Vegetables (country)	$\frac{1}{4}$	,,

Tamarind, onions, garlic, turmeric and salt.

For those under 12 years, half the above quantity is allowed.

KURNOOL.

By Assistant Surgeon W. F. deFabeck.

"The diet of the inmates of the jail consists for the most part of a fixed quantity either of rice or cholum, to which the prisoners have the privilege of adding chillies, tamarind, &c. &c. in the preparation of their food—extras including meat, ghee, milk, &c. being only used by some of them at the recommendation of the Medical Officer in charge. The greater number of prisoners are Soodras, who form also the labouring class of this (Teloogoo) district, the remainder being Mussulmen and Hindoos. I have never seen a European or East Indian prisoner in the jail. The Mahomedans are for the most part towns-people; they usually adopt a varied diet, a considerable quantity of animal food being combined with the farinaceous and other vegetable nourishment they habitually indulge in; and as a consequence we find them by far the most active and powerful class of the native population; and it is worthy of mention that the Mahomedan prisoners have seldom occasion to resort to the hospital on account of disease. The country people on the other hand live principally on cholum. In the Markeepoor and Cumbum talqus however, rice is the staple commodity; milk either new or sour, butter, &c. being also very generally used. A few other kinds of grain are cultivated; namely, arka, cumboo, raggy and varegaloo. These are not served out to prisoners—a preference is exhibited by many of them for rice, which is not indulged, and there is no doubt that cholum affords more nourishment, and a proportion of the bran of this grain is also taken daily, a decided advantage to those who are able to digest it. The cholum is prepared either to make cakes, or for boiling after the manner of rice. In the former case, the grain having been ground down is mixed with water and baked. In the latter, the grain is first pounded so as to loosen the bran, which by tossing and winnowing is removed; both the grain and bran are now well washed, and the supernatent liquor with the bran is removed and the grain dried. The "bran water" is now exposed to the sun and becomes sour; it is thus pre-

pared to be boiled with the grain as rice is boiled. The food, which it is said would otherwise be most insipid becomes palatable ; chillies, &c. are added to make it still more acceptable. A similar mode of preparation is followed both in the district and in the prison.

Taking into consideration the amount of work done by the prisoners, the ration they receive is amply sufficient. Those of the prisoners who labour outside the jail leave it between 7 and 8 o'clock A. M., and return from work about 4 P. M. The first meal of the day is taken *by all* the prisoners at the same time, and before any of them leave for work, the second meal is taken by all on the return of such as have been employed in out-door labour.

It is probable that the fast is too long, and that it would be more conducive to their health and strength were the prisoners permitted to take the second meal somewhat earlier, and work recommenced after a short interval. The labouring classes in the district either take a hearty meal before any labour is begun in the morning (the very time that food is most beneficial to the system) or as soon as such work is complete as may detain them at home,—on proceeding to the fields they take a substantial meal with them or it is sent them for consumption about mid-day they return often at 7 or 8 P. M., and again indulge in a hearty meal previous to retiring for the night—this part of the arrangement appears to be decidedly objectionable. The labouring classes usually work longer than the prisoners, and take (as they require it) a larger quantity of the same food. There are periods of the year when the work is relaxed—the amount of food is then diminished, but taken at the same time of the day. Were any addition made to the diet of the prisoners employed at hard labour, I would suggest the use of milk in preference to any other article of diet. It is one to which the people are generally accustomed, and it is well able to sustain assimilation. Meat can seldom be required, and ghee is comparatively speaking of less advantage.

The jail of Kurnool is one of the most healthy, and there is good reason to believe that our prisoners are not less healthy than the labouring population of the district generally. The diseases most generally met with in the jail are fever, bowel complaints, guinea worm, and abscesses of a trifling character prevail to a great extent among the native community, and cholera which breaks out almost annually in some part or other of the district attacks but few of the prisoners.

MADURA.

By Assistant Surgeon R. Wilson, M. D.

To facilitate this enquiry, the inhabitants may be divided into two great classes, viz: those who by caste prejudices are limited to a vegetable diet—these are mentioned marginally and in the order of their social status.

1. Brahmins.
   Cash Chetties.
   Cometies.
   Vellalers
   Moodeliars.
   Weavers.

2. Cowherds.
   Gentoos,
   Oil Mongers.
   Agambadier's.
   Maravers.
   Cullers.
   Valyers.
   Kycalares.
   Chaliers.
   Paravers.
   Shanars.
   Chucklers.
   Pullers.
   Pariahs.
   Mahomedans.

And secondly, those castes who are permitted to combine animal with their vegetable diet—these are named marginally and in their order of importance.

I may here mention that the district of Madura being only sparingly supplied with water for irrigation purposes, the great mass of the agricultural population are necessarily confined for food to what is commonly called "dry grains," the different varieties of millet which are grown without irrigation. These dry grains are not held however in the same estimation for food as rice by the natives, and where rice can be afforded, it is generally substituted, or at least alternated with the other grains.

Rice is a more expensive article of food than the varieties of millet.

The grains used as food I give in the order of their importance.

Rice (oryza sativa) is used chiefly by the more opulent class of Natives and residents in towns; it is prepared for food by boiling and eaten with curries either animal or vegetable.

Raggy (eleusine coracana). This is probably the most generally cultivated of the millets, and forms the great staple of food of the poorer classes throughout the district.

It is prepared for food as follows:—after being dried in the sun and separated from any impurities such as sand, &c., it is ground into flour between two stones, the flour is then boiled with water and a little salt (like porridge) and is eaten generally with a vegetable curry; this latter is composed of some of the leguminosæ, such as beans or gram, cucurbitaceæ, as pumpkin or water-melon with chillies. Capsicum annuum, a little of the pulp of the fruit of the tamarindus indica, and probably some ghee.

This porridge and curry forms the evening or principal meal of the day and is eaten about 8 P. M. The quantity being about half a measure of flour (about 1½ lbs. besides the vegetable curry for an adult man.

The morning meal is prepared somewhat differently, the raggy-flour being boiled in sour conjee-water (or rice-water allowed to stand three or four days, when it takes on a process of fermentation) or sour milk with a little salt. This is not of such a thick consistency, as for the evening meal; it is eaten for breakfast at 6 A. M.; a portion of this meal is kept over to be eaten cold at 1 P. M. These meals, morning and mid-day together comprise about the same quantity of flour as the evening meal.

The porridge is sometimes eaten with sour milk, curry being as a rule only eaten at the evening meal.

Cumboo, (holcus spicatus) is also much used among the agricultural population, and after being dried in the sun and reduced to flour, is sifted to remove the husk or pericarp, and is prepared for food in the same manner and eaten in the same quantities as raggy. This grain contains a considerable quantity of vegetable oil; if bruised and steeped in water for some hours, oil globules will be found floating upon the surface.

In the south-east part of the district, a caste called Reddies (a sub-division of the Gentoo caste) live, who use this grain almost exclusively for food, and they are remarkable as being a robust, tall, muscular race; they are an agricultural people. I have measured some few of these people at the Civil Hospital and found them 6 feet in height and stout made in proportion; they are not remarkable for their consumption of animal food.

Cholum, (sorghum vulgare) is a grain in common use, and is prepared for food in the same manner as raggy and cumboo. Instead of being boiled, the flour of these three millets is sometimes kneaded with water and jaggery, coarse sugar, and made into cakes being cooked or baked in earthen chatties.

Varragoo, panicum frumentaceum.

Tenei, panicum italicum.

Samei, panicum miliaceum.

Agathy, a grain chiefly used by the weaver caste, and prepared for food by being reduced to flour.

There are several other varieties of the graminaceæ, occasionally used for food in the district. The above are the principal grains used in the district as food; so far as I know, all the fruits of the graminaceæ are dried in the sun, ground into flour by the women between two stones, (an original hand-mill,) and prepared for food by being boiled with water, sour milk, or fermented-conjee-water, and eaten in the form of porridge or made into cakes. The quantity

consumed daily by an adult man is about one measure or 3 lbs. exclusive of curries, and fruit when in season, such as cucumbers, water-melons, large quantities of which are consumed raw or uncooked, and mangoes, (the fruit of the mangifera indica) frequently eaten quite green. Ghee or clarified butter generally enters more or less into the composition of all curries, but being an expensive item, its quantity depends upon the social status of the consumer.

Brahmins and the other few castes I have mentioned as vegetarians are not strictly so, as they indulge to rather an unlimited extent in milk, curds and ghee; the latter article being looked upon by all Natives as the great "fat supplying ingredient" in their food, and as it is the universal wish of all Natives to be fat, stout, and oily, the use of ghee as an article of food is only limited by their means and power of digestion. I may here remark that though Brahmins and the other higher castes own land, they do not as a rule work in their fields; but retain some of the lower castes, who are attached to the land, something like *serfs*—these latter receive food of the most common description, and a small modicum of clothes from their masters. However strange this may appear and difficult to reconcile with English ideas, nevertheless should the land change owners these labourers are transferred with it.

The flesh-eating castes but rarely indulge in animal food—on an average not more frequently than once in ten days, this article of diet is also limited by the means of the consumer—some of the poorer classes only get a little mutton or goat-flesh on great feast days or marriage festivals. An adult native is satisfied with three or four ounces of meat at a time for his curry, but will eat much more if procurable gratis; some of the lower castes, such as Chucklers, Pullers and Pariahs will eat swine's flesh with avidity, and will congregate to a focus from a wide circle on the intelligence being received of the death of a cow, bullock or buffaloe, from either natural causes or accident, and carry off the flesh for food, and even fight over it though in a state of decomposition. Oxen are not killed as an article of food in the district.

The scale of diet here mentioned for the poorer classes only refers to years of abundance, but in years of scarcity they are reduced to various shifts to eke out sufficient to support life, being then necessitated to use leaves and roots of various trees and plants; these are cooked by being boiled with a little salt and are used as a substitute for grain.

The castes commencing with Maravers also eat the flesh of pigs, these

animals being kept in large herds in nearly all Hindoo villages, and as they receive no food from their owners, they prey upon all the offal to be found around the village.

All the flesh-eating castes consume, when procurable, eggs and poultry.

The class of people named Lubbays, in religion Mahomedans, residing principally in the towns and villages along the sea-coast are a stout, robust and muscular race of men ; they appear to be descendants of Mussulmen, who established themselves in these localities for the purposes of commerce at a remote period, and of native females of the lower Hindoo castes. They live generously and consume animal food to a considerable extent with rice and ghee, the name of Lubbay being synonymous with being fat, sleek and oily. These men lose flesh very considerably when confined in jail and reduced to prison fare. I remember one instance of a Lubbay losing 16 lbs. in weight after being confined in jail six weeks.

Prisoners in the zillah jail receive the following scale of rations daily.

65 Rupees weight of coarse rice for each working adult prisoner equal to 29 oz. of rice.

60 Rupees weight of rice to prisoners without work or 27¼ oz. of rice.

54 Rupees weight of rice to female prisoners or 24¼ oz. of rice.

Rice is issued to the prisoners of this zillah five days during the week, raggy being supplied on the other two days.

60 Rupees weight of raggy to each working adult prisoner.
54 Rupees weight of raggy to prisoners without work.
50 Rupees weight of raggy to female prisoners.

It would therefore appear that the prisoners are not allowed an equal amount of grain for consumption as the civil population, but receive instead a little animal food more frequently.

There is in addition to the dry grains an allowance daily of four pies (about one-halfpenny English money) to each prisoner, with which the contractor supplies to the prisoner a few ordinary vegetables, a little pepper, chilly, coriander seed, tamarind and ghee to make a curry ; he receives also twice a week about 2 oz. of mutton which is added to his vegetable curry. The prisoners cook their own food after their return from work about 4 P. M. The prisoner is locked up in his cell at 6 P. M. for 12 hours ; next morning the prisoner breakfasts about 6½ A. M. on the remains of his dinner, cold, unless in periods of sickness, such as cholera, when he is allowed

to cook and have a warm breakfast on the recommendation of the Medical Officer.

The prisoner proceeds to work on the roads at 7 A. M. and continues until 12 A. M., when he has rest for an hour; he re-commences work at 1 P. M. and continues till 4 P. M., when he is marched back to prison and his work terminates for the day.

The amount of work done by prisoners is probably not equal to that done by the lower classes in civil life in their own homes; but the prisoners are coerced to the performance of their work, and under the continuous inspection of a maistry or overseer, they eat, cook, draw water, and work by rule. There is no relaxation unless on Sunday, or during sickness. While in prison the feeling of confinement preys upon and depresses the mind of many prisoners, more especially in the early months of confinement when they generally lose flesh, but after a period of, say 6 months, the lower classes who are most probably but poorly fed before admission to prison, generally (about 75 per cent.) gain flesh, while those classes who are able to procure food in abundance and are not probably subject to manual labour outside the jail, after losing flesh in the first months of imprisonment do not seem to gain ground afterwards equally with those of the lower classes.

The jail at Madura is an old pile of native buildings, and has long since been condemned as being permanently faulty in construction and ventilation; it is probably at present the most unhealthy jail in the Madras Presidency. The mortality has been for the last twenty years at the ratio of 10·50 per cent. annually—sufficient to condemn any building as a prison or place of confinement for human beings.

A new jail has been, I believe sanctioned, but it is problemetical when its construction may be commenced with.

MANGALORE.

By Assistant Surgeon S. Rule, M. D.

I have the honor to report that the food of the prisoners in the jail in my charge consists principally of rice, and that it is almost exactly of the same description as that used by the labouring classes in the surrounding districts.

Prisoners at hard labour receive 65 Rupees weight of uncooked but clean rice, those in confinement simply 50 Rupees weight. Natives outside use about 76 Rupees weight according to their means and appetites.

As to cooking, the rice is always boiled—this is done carefully so that it never presents a sodden and sticky appearance, but when a small quantity is raised and allowed to fall, the grains descend separately.

The common adjuncts to the rice are fish or vegetables made into a curry with the usual aromatic powder, ghee, and cocoanut ; meat is very seldom used, but it is supplied to weakly prisoners on the order of the Medical Officer ; from ½ to 1 oz. of curry powder is used daily, and about 2 or 3 oz. of fish or vegetables—the vegetables are generally of a succulent watery character of which the pumpkin is a type, the fish, any kind that is cheap and not unfit for food.

The diseases which are most common are those of the abdominal viscera and the skin ; they are always of an asthentic type. I think the food is nutritious enough, and a strong man no doubt easily digests it, but perhaps for a man of little power, some more digestible and less bulky form would be preferable. The causes of disease both among prisoners and the labouring classes will be found to be other than that of inappropriate food in most instances. In the latter, to exposure from deficient clothing, want of personal cleanliness, and living in dirty ill-ventilated huts ; in prisoners, to their having been previously weakened by the foregoing causes, and being depressed by a sense of degradation, and in those with long sentences by depression of spirits and hopelessness. Natives of this district are short in stature and not at all muscular, their conformation being generally very spare. They are incapable of severe and long continued exertion, though their strength and endurance is greater than would be expected from persons of their conformation.

MASULIPATAM.

By Assistant Surgeon C. Robertson, M. D.

"It appears that the labouring class of people in this zillah live almost entirely upon rice which grows abundantly, though latterly its price has been much increased owing to the large quantity annually exported.

In consequence of this increased price, the lower class of people have frequently to subsist in great measure upon raggy, cholum, or cumboo, but rice is generally preferred whenever its price is such as to place it within the reach of these people.

The average quantity of rice consumed by a labouring man, is one seer (80 Rupees weight) per diem. The curries which always form part of a male consist of cucumbers, brinjalls, dholl, green-gram, &c.

The prisoners in the zillah jail, Masulipatam, are almost all of the labouring class of people. These men receive 55 Rupees weight of rice and 5 pies for curry per diem; out of these 5 pies one is stopped every day giving them half an anna at the end of the week to enable them to buy mutton. The rice given for their consumption is of a common sort, and the vegetables for curry are cucumbers, brinjalls, dholl, green-gram, tamarind, &c.

Formerly they were in the habit of receiving 65 Rupees weight of rice, but an alteration was made under the impression that the diet they now receive was less calculated to predispose to beri-beri, of which a considerable number of cases are generally to be met with here. This alteration however has given rise to general discontent among the prisoners, who state that they would much prefer the former scale of diet.

Though from having been so short a time in charge of this jail, I should hesitate to give a decided opinion, still from what is known of beri-beri, I do not think that the abstraction of a few Rupees weight of rice, and the additional few condiments could materially assist in averting this disease, and as this alteration gives rise to a constant and general complaint, I should be inclined to recommend a return to the former scale of diet. I believe that a more liberal supply of animal food, such as was given here several years ago would be much more likely to prevent the appearance of beri-beri."

NELLORE.

By Assistant Surgeon H. Adam.

The character of the soil of this district is along the coast and for some distance inland sandy, and the sub-soil lateritious. For a distance of fifteen or sixteen miles from the coast, irrigation channels from numerous tanks and the rivers of the district supply water for the wants of the cultivator; but more inland, where the country is hilly, dry grains only are produced. Where water is abundant, rice is grown and used for the food of the people, but where dry grains are more favorably cultivated and offered at a cheaper price, the diet of the inhabitants, and this in the majority, consists of cholum, raggy, sajja, coraloo, different kinds of sorghums, and millets.

The inhabitants of this district may be divided into the following classes; Mahomedans, Brahmins, Bunyans, Caupoo Reddies, Soodras, Pariahs and Chucklers. Of the higher of these, there are numerous subordinate sects, or castes, but this enumeration is sufficient to classify all the native community. There are Eurasians also, but few elsewhere than in the Sudder station, and their

number bears but a small proportion to the general population. This district cannot be called a rich one ; only in the larger towns, and in a few of the trading ports along the coast, are there to be found a few men or families of means. The majority are of the poorer classes who earn their livelihood by cooly-work, herding cattle, and the like, and they use only the cheaper grains for food, the coarser kinds of rice, cholum, raggy, and so on. There is one class of natives, and these the healthiest of the inhabitants, the Yanadies, a sub-caste of Sudras, who use as articles of food several different kinds of roots, leaves and flowers. The inhabitants of the hilly tracts are generally speaking hard-working, they have to contend much against the natural difficulties of the soil, &c. The Brahmins and Bunyans, and the wealthy classes of the people are notoriously sedentary in their habits.

Rice, paddy (oryza sativa) is as has been said cultivated, but to a comparatively small extent in the eastern parts of this district. There are two sorts, the fine and the coarse or red rice, the former used only by the better circumstanced of the community ; the coarser and cheaper variety, such as we use in this jail is eaten by the working classes. Cholum, (holcus sorghum) cumboo, sujilloo, (holcus spicatus) raggy, (elusine corocana) are the staple articles of food of the poorer, and labouring classes of the community. They are chiefly grown in the western parts of the district, and on elevated sites requiring but little irrigation. Other grains such as varigaloo, arigaloo, corraloo, samaloo are cultivated and used as articles of food, but this not to such an extent as to be considered staple articles of diet.

Rice when taken as an article of food, is by different classes of the community subjected to different operations before use. The working and poorer classes of the people, owing to its cheapness prefer the red or coarser kinds of rice, and they do not so thoroughly wash it as do those of better circumstances; new rice is by them also preferred for food, simply dried in the sun, beaten to husk it, then boiled and used at once. The upper and middle classes of the people, when the rice is taken from the field, bury it in straw under ground. It is kept in this condition for about three months, and by this process it loses in nutritive quality, has the character of old rice, and is considered easier of digestion. After husking, the rice is well washed, boiled and used for food. The better classes throw away the starchy conjee-water, which the poorer classes use as a portion of the meal, and this is sometimes also carefully retained and kept for several days, and used in a fermented state and considered beneficial to health. It is principally in hot weather that this is indulged in. Again the rice washings, before the grain

is subjected to boiling, carrying with it a quantity of the starchy particles of the rice, is kept and used in making broth and pepper-water. And I would note that in this district, as also I believe in the more northern countries, the practice of boiling and then drying the paddy before husking is omitted, and a more nourishing food produced than in Madras and other southern parts of the Presidency.

The other grains enumerated as forming the staple article of food are prepared in a variety of ways; cholum, cumboo, varigaloo, are after husking and washing, boiled and used as a meal in the same manner as rice. But more generally cholum, cumboo, raggy are ground in a mill and formed into cakes, sunkatty, or porridge. Arigaloo can only be prepared in the form of rice or porridge. The quantities of these different grains that can be used at a meal varies according to the means of the individual; and of all of them, one seer and a half to two seers of dry grain, or in other words three to four pounds without reckoning condiments, curry-stuff, flesh or vegetables that may be used, is considered a very moderate supply for the twenty-four hours.

Different kinds of pulses, varieties of phaseolus dolichos and of cajanus indicus are used in the making of chatnies and broth, and of these green-gram, dolichos? (Tam. sirupay) is the principal ingredient; cucumbers, tamarind, chillies, mangoe, brinjalls and the gogoo leaves (a kind of roselli) are all severally or collectively made into other chatnies seasoned with salt, chillies and garlic according to taste. Butter-milk is generally used by all classes as an adjunct to their meal, and by those in good condition only ghee is used; it is too expensive a condiment for the use of the poorer classes. Pepper-water likewise made with tamarind, chillies, salt and other condiments, is only used by those who can afford it, and in all classes from a Brahmin upwards to a Pariah downwards, all use chillies in large quantities. Animal food is but sparingly used as food by the natives of this district. Fish is procurable every where and freely used, and by the lower classes crabs and other shell-fish, even rats and other vermin are eaten as food.

"Each prisoner in this jail receives daily 65 Rupees weight of rice, "those not able for hard labour 60, and prisoners waiting trial 54 Rupees "weight. Tamarind, chillies, salt and other sundries, with butter-milk, "vegetables and ghee every second day are the other articles of diet. Mutton "and other extras are given when recommended by the Medical Officer for "those requiring them, and the weekly savings made upon the cost of "weekly diet, provide on Sundays a sufficient supply of mutton, fish, or some "other extras for the whole body of prisoners." *

* Quoted from Annual Report for 1860-61.

The quantity of dry grain supplied as stated above for the prisoners in this jail, is in my opinion ample, and as much as their stomachs can digest; of tamarind, chillies, salt and sundries, which consist of fenugreek, garlic, cummin to the extent of nearly 2 oz. of all condiments, and with ¼ seer of butter-milk is sufficient to satisfy the wants of all. Animal food is supplied but in small quantity, once a week only do the men receive any, and that dependent in quantity on the amount of savings they are able to accumulate from firewood, &c. Ghee is supplied every second day, half pollum to each man, and to the work maistries each a double share, but since a Native estimates his food more by quantity than quality, I know that animal food would be greatly preferred to the ghee that is allowed them. The diet is a great deal more suitably chosen for them than they themselves would procure for their own use were they at liberty. I do not consider it too much, for each had he the means when out of jail, would gorge himself with a great deal more. The health of the prisoners is very good, the exercise they undergo invigorating, the food on the whole sufficient and nutritious, and though on their admission to jail, prisoners complain of the smallness of their diet, and patients in the Civil Dispensary likewise say it is less than they have been accustomed to, it is as much as the powers of digestion of the recipients can and do assimilate. A number of prisoners who come to this jail for different periods of confinement, on their first incarceration complain of dyspeptic symptoms, and this in my opinion is attributable to the change in the character of the food, for as I have shown, cholum, raggy, and cumboo are the staple articles of diet and the immediate change to rice for a time affects them. But men of long sentence, and there are some who have been upwards of twenty years confined here, improve in condition the longer their period of imprisonment lasts, and leave the jail in a better state of health than when first admitted.

OOTACAMUND.

By Assistant Surgeon L. W. Stewart.

The Native inhabitants of Ootacamund and the Hills generally include Burghers, Todars, Khoters and Koorumbers, Mahomedans, Malabars, Brahmins, Pariahs and Canarese.

The labouring classes comprise Burghers, Canarese and Pariahs, though

Mahomedans who are in bad circumstances occasionally work as labourers. The two former live chiefly on a grain called korally, and raggy, a kind of millet. The Pariahs eat the third sort of rice and potatoes, and in fact any thing that they can procure.

Besides the Burghers, the Todars, Khoters and Koorumbers live principally on the grain (millet) which they themselves grow. Buffaloes' milk also they drink, and ghee they use, but no other kind of animal food do they partake of ; exceptions are now being made to this rule in the case of the Burghers, who eat mutton and fowls when they are able to procure them. They are all as a class healthy and stout, except perhaps the women and children of the Todars, who suffer much from primary and secondary syphilis.

The following are the different grains procurable on the Hills, most of which are sold in the bazaar and used by various castes ; viz., korally, raggy, samay, ganjee, dholl and gram, rice of different sorts.

Korally and samay undergo repeated poundings similar to the way in which paddy is treated. The color of the first of these after being boiled is dark brown, and of the latter dirty white, like the rice when cooked.

Raggy is reduced to powder mixed with hot water, and then boiled till it becomes thick like paste. It is eaten with or without curry.

Ganjee is treated very much in the same way, only it is previously roasted and then pulverised.

Dholl and gram are generally made into curry, which is eaten by the labouring class generally.

Meat is used but seldom by the labouring classes—once or twice a week is the average number of days in the week they treat themselves to it.

Of the Hill grains and rice, the following is the average quantity used at one meal.

Raggy...	24 ounces.
Korally	24 do.
Ganjee flour...	18 do.
Samay	24 do.
Rice	16 do.

Diarrhœa and dysentery have been complained of chiefly amongst the Mahomedans. Fevers including intermittent, remittent, and continued, have been mostly amongst the Pariahs. Mahomedans are proverbial for their dirty habits, and it is this class generally who are more sickly than others.

Persons recently arrived on the Hills suffer from fever and rheumatic affections. The want of suitable clothing, it is presumed causes a sudden determination to the internal organs, and it is to this cause more than from species of diet that sickness amongst the native population is to be attributed.

The prisoners in jail receive daily :—

	Rupees weight.
Rice...	60
Turmeric.	$\frac{1}{8}$
Mustard, pepper, and cummin seeds... ...	1
Chillies...	$\frac{3}{8}$
Garlic.	$\frac{1}{4}$
Onions...	1
Tamarind...	1
Salt	$2\frac{1}{2}$
Dholl.	$3\frac{1}{4}$
Potatoes or other vegetables	$7\frac{1}{2}$
Mutton three times a week	$3\frac{1}{2}$

It is remarked that whatever the diet may be, diarrhœa and dysentery are very prevalent amongst the prisoners.

Except in particular cases where they have been accustomed to other grain than rice, this scale of diet is persisted in. The prisoners often complain of the potatoes as causing disordered bowels, at one time they eat the skins of this esculent, which was prohibited as soon as it was discovered.

PAUMBEN.

By Assistant Apothecary J. Sausman.

"The food of the agricultural and industrial classes of this district (Madura) might be arranged under five groups, viz., cereal grains, animal substances, leguminous seeds, vegetables and condiments.

Under each of these groups the following substances are most commonly and generally used.

I. Cereal grains—rice, raggy, (or as it is here called capa) cumboo, (pencillaria spicata) cholum, (sorghum vulgare) and varrugoo (panicum miliaceum.)

II. Animal substances—mutton, fish, fresh and salted, domestic fowl butter-milk and tyre (sour milk).

III. Leguminous seeds, mootchocottay, (lablab vulgaris) thovarypurpoo, (cajanus indicus) putchu pyroo, (phaseolus radiatus) oolundoo, (phaseolus mungo) and cadalai (cicer arietinum.)

IV. Vegetables, brinjall (solanum melongena) perkinkai (cucumis acutangulus) podalankai, (trichosanthes anguina) mooringaykai, (moringa-ptery gosperma) cottaveraykai, (dolichos fabaformis) poosanikai, (cucurbita maxina) choraykai, (lagenaria valgaris) and various greens (amaranthus.)

V. Condiments, chillies, coriander, turmeric, tamarind and salt.

The cereal grains constitute by far the greatest proportion of the articles of diet: while to a great number they furnish almost the only means of support: rice being the most palatable is preferred to the other grains; but it is not always within the reach of the poorer classes, as it costs twice as much and necessitates an outlay for either animal or vegetable substances: whereas the coarser grains (raggy especially) might be and are partaken of by many for days and days together, without any of the other alimentary substances.

The relative value of these grains are so well known, that it would be superfluous to explain why this should be so; sufficient to mention the fact, that experience has taught the Natives, what Science has proved to be a necessity; viz., *a due admixture of alimentary principles;* and from the alimentary substances enumerated above, it will be seen a liberal choice is afforded them, a choice only limited by their means to procure them.

From what has already been stated, it will be gathered that rice is the chief staple to those able to afford it, while the coarser grains are confined to the poorer classes; and as a general rule this is true; but the nutritive qualities of the coarser grains (raggy particularly) are so much appreciated that even the wealthy portion of these classes often partake of them.

Owing to the difficulty experienced in shelling and removing the bran from the coarser grains, they are much more indigestible than rice; but this appears to the Native as a positive advantage, as it enables him to continue much longer without food, and the irritation which they might be supposed to produce to the alimentary canal is obviated by their continued use; besides, although they know nothing about the external covering of the cereal grains containing more gluten than the interior, and consequently being more nutritive, they practically act up to the fact.

It will be necessary to confine myself more particularly to the poorer of these classes, as it is from them that our jails are principally tenanted; but making every allowance for the greater variety afforded to the wealthier portion, the modes of combination and preparation of the different alimentary substances as a general rule are the same, the difference being not so much in quality as in quantity.

Two meals a day are as much as can be afforded, one in the morning and the other in the evening, even when a third meal is made use of, the quantity consumed is the same.

The evening meal is the most important one, and when raggy is used, the flour is either boiled with water into a paste or made into cakes and eaten with a curry composed of the pulses or vegetables of the season, and condiments. Cumboo and varragoo are boiled like rice and eaten with the curry, which in either case forms a very small portion of the entire meal, about $\frac{3}{4}$ of a measure (1 lb. 12 oz.) of any of these grains is about the average daily consumption. The whole of it is prepared in the evening and about $\frac{3}{4}$ partaken of, while the remainder is put by for the morning, when it is mixed with water into a kind of porridge and drunk with either a chilly or a little atchar by way of zest. Occasionally butter-milk or tyre is substituted for the water.

Raggy is most frequently used, rice and animal food are luxuries only indulged in on rare occasions.

In the preparation of their food, the utmost economy is observed, literally nothing is lost; the water in which the grains are boiled is never thrown away, but drunk at the meal or mixed with the portion put by for the morning meal. The curries are prepared by grinding the condiments, mixing them with water, adding the pulses or vegetables and boiling down to the consistence of a thin conjee as is noticed in their preparation of the other articles of diet.

I have not been long enough in the district to be able to offer any decided opinion as to the influence the dietary has in health or disease, but as far as my observations have extended, I have no reason to believe but that a fair amount of health is enjoyed by these classes. Certainly, no classes of disease or diseases have been noticed by me that can in a manner be connected with the dietary in use; On the contrary, I have observed the absence of that great tendency to dropsical effusions so often noticed in Natives in general.

The following is the weekly allowance per prisoner in the Paumben jail.

		every day.	oz.	drs
Sunday......	Rice, 65 Rs. weight, nearly 1 lb. 10 oz.	Salt....	1	3
		Tamarind	0	4
Monday, Wednesday & Friday.	Raggy, 60 Rs. weight, 1 lb. 8 oz. each day.	Chillies	0	2
		Coriander, turmeric, pepper, onions and mustard. ...	0	$2\frac{1}{3}$
Tuesday, Thursday & Saturday.	Cumboo, 60 Rs. wgt., 1 lb. 8 oz. each day.	Vegetables	1	$1\frac{1}{2}$
		or Pulses	1	0
		Salt-fish	0	$2\frac{1}{4}$

On Sundays, instead of the vegetables and salt-fish, about 8 oz. of mutton is allowed.

The quantity for one day is divided so as to furnish two meals. One partaken of at 6 in the morning and the other at 4 in the afternoon; but the whole quantity is cooked at once in the evening.

The preparation of the food is in every respect identical with the mode described above.

Comparing the two scales of diet, it will be observed that the prisoners are as well fed as they were before confinement: for although the quantity of grain is smaller, the other articles of the jail dietary are on a more liberal scale than these men could have afforded when at liberty. No doubt many of the prisoners have been accustomed to better food; but it is equally certain that many others, and no inconsiderable number either, have been great gainers by their being sent to jail, at least as far as food is concerned.

The present dietary has only been in operation the last six or seven months: previous to that a much more liberal diet was allowed both in quantity and quality, so that it is rather too premature to draw any conclusions as to the influence the jail diet may have on the health of the prisoners. This jail has always had the reputation of being a healthy one, and the records prove that the prisoners have enjoyed excellent health. I have been informed that the prisoners were in much better condition before the recent change of diet was effected. When I took medical charge of the jail in September last, a great deal of opposition was evinced by the prisoners towards the new scale of diet, and of course there was no disease or ailment that was not attributed to it; but making allowances for effects which were naturally to be expected, I

saw no reason to believe that the change would prove detrimental to the prisoners. Just now they enjoy good health, the greater number in hospital suffering from a mild form of intermittent fever which readily yields to treatment. Fever is at this period of the year very prevalent, and it is remarkable that the cases which have come under my treatment among the detachment, Sappers and Miners, Police and Villagers, present a severer form and a different type from what I experience in the jail hospital.

This in a great measure must be attributed to the jail being better ventilated, and kept a great deal cleaner than the huts of the "sepoys and villagers."

RAJAHMUNDRY.

By Assistant Surgeon J. McDonald.

In forwarding the report on the usual diet of the different castes in the district in and out of jail, I have the honor to state that the district is on the whole healthy with one exception; namely, anasarca, or what is commonly called beri-beri. This disease seems to be more frequent amongst Brahmins or purely vegetable-eaters than in the other castes; but all castes are liable to become affected by it, more especially those who have had their constitution any way debilitated by disease: For instance, diarrhœa or fever for some time continued frequently brings on the disease, but on the whole as a district, the food used seems to agree well with the constitutions of the inhabitants. I forward along with the jail diet tables—tables which have been prepared with as great care as possible, giving the quantities and qualities of the food used by the different castes, and I fancy from the manner in which the information has been collected they are pretty correct; that is, a few men of the different castes have permitted one of my dressers to see the food weighed before using it, and what was left not eaten again weighed, so as to get the actual quantity taken. An average has been struck in each of the castes and the weight of each of the ingredients shown in the table.

In the jail each prisoner is allowed 4 pies or $\frac{1}{3}$ of an anna daily, and with this he can get any addition to his regular jail diet that he may wish. The prisoners club together, at least all those who eat flesh, and have each a small supply of mutton once a week; this is paid out of their daily allowance of 4 pies.

In this jail there are generally a great number of persons under trial; these have ten rupees weight per diem less rice than the working prisoners, yet they do not seem to suffer in any way; in fact, it is a rare thing for an

under trial prisoner to report sick. The working men complain often that they have not a sufficient supply of vegetables and meat, but I have not considered it necessary to recommend any change in the diet, as the prisoners as a body are in very fair condition and health. On the whole, I do not consider that the jail diet although differing considerably from the diet of the different castes in the district disagrees with the prisoners. Hill men suffer a little at first, but they do not complain of the food disagreeing with them, but often complain of the water, which is pure and taken from the Godavery river. The only alteration that I would propose is, that the daily allowance of four pies be increased to six pies or half an anna. This would enable the prisoners to get meat and vegetables oftener than they now do.

The probable quantity of food taken daily by each person of the following castes.

Articles.	Quantity. lbs.	oz	dr
First Class Brahmins.			
Fine rice...	...	12	...
Dholl...	...	4	..
Salt...	...	...	8
Ghee...	...	4	...
Tamarind fruit...	...	2	..
Chillies...	...	1	4
Vegetable curry...	...	8	...
Chatney of sorts...	...	4	...
Tyre or Butter-milk ...	2	...	...
Pepper-water...	1	...	...
Sweet cakes about...	2	...	...
2nd Class of Brahmins.			
White rice...	1	...	...
Salt..	...	...	4
Dholl...	...	4	...
Vegetable curry...	...	4	...
Ghee...	...	2	..
Curry stuff...	...	1	4
Tamarind fruit .	...	2	..
Chatneys of sorts...	...	2	..
Jaggery...	...	..	4
Pepper-water...	1	..	...
Sweet cakes about...	1	..	..
3rd Class of Brahmins.			
Rice...	1	8	..
Dholl...	...	4	.
Vegetable curry...	...	4	...
Ghee...	...	1	...
Salt...	..	2	..
Curry stuff...	...	1	4
Chatney...	...	1	...
Butter-milk or Tyre...	1	...	...
Pepper-water ...	1	...	...
1st Class of Rajahs or Zemindars.			
Fine rice...	...	12	...
Dholl...	...	4	...
Mutton ..	...	8	...
Ghee ..	...	8	..
Vegetable curry of sorts.	...	8	..
Chatneys of sorts...	...	4	..
Tyre or butter-milk ...	1	...	...
Pepper-water ...	...	8	...
Garlic...	...	...	2
Onions...	...	4	...
Salt...	...	2	...
Tamarind...	...	4	...
Curry stuff .	...	2	...
Sweet cakes about .	1	...	...
2nd Class of Rajahs or Zemindars.			
Rice...	1	...	...
Dholl...	...	4	...
Mutton or fish, one kind	...	4	..
Vegetable curry...	...	8	..
Ghee...	...	4	...
Salt...	...	2	...
Curry stuff...	...	1	4
Tamarind fruit	...	2	..
Garlic...	...	.	2
Onions...	...	2	..
Chatneys...	...	2	...
Tyre or butter-milk...	...	8	.
Pepper-water ...	1	.	..
Sweet cakes about ...	...	8	..
3rd Class of Rajahs or Zemindars.			
Rice...	1	8	

Articles.	Quantity, lbs.	oz	dr
Salt...	...	4	...
Dholl	...	3	..
Mutton or Fish... ...	...	4	..
Ghee...	...	1	...
Curry stuff... ...	...	1	4
Tamarind fruit... ...	...	2	...
Garlic...	...	...	2
Onions...	...	2	...
Chatney...	...	1	..
Pepper-water	...	8	..
Butter-milk or Tyre... ...	...	12	...
Banians like Brahmins only.			
RICH GENTOOS LIKE RAJAHS.			
The quantity of food taken 3 times a day by each cooly.			
Breakfast.			
Rice...	...	8	..
Conjee or butter-milk... ...	2	...	..
Salt...	...	...	2
Dinner.			
Rice...	1	...	...
Curry...	...	8	...
Butter-milk... ...	1	...	...
Salt...	...	2	...
Curry stuff...	...	1	...
Tamarind fruit... ...	...	2	...
Onions...	...	...	6
Garlic...	...	..	1
BRINGARIES, RAJPOOTS, MARWARRIES, &c., 1ST CLASS OF BENGALEES.			
Wheat flour	2		...
Ghee...	..	8	...
Sugar	...	4	...
Chatney...	...	2	...
Dholl...	...	4	
Curry stuff...	...	...	4
Vegetable...	...	8	...
Salt...	...	2	.
Milk	2	...	..
Rice...	...	12	..
2ND CLASS OF RAJPOOTS.			
Rice...	1	8	..
Ghee...	...	4	...
Dholl...	...	4	...
Salt...	...	2	...
Vegetable curry	...	8	..
Chatney...	...	2	...
Tyre...	1	...	...
Curry stuff...	...	...	4
Wheat flour...	...	8	...
3RD CLASS OF MARWARIES.			
Rice...	1	8	..

Articles.	Quantity. lbs.	oz	dr
Ghee...	...	2	...
Salt...	...	2	...
Dholl	...	4	...
Curry stuff...	...	..	4
Butter-milk... ...		...	...
Vegetable curry... . .	...	8	...
Goldsmiths, Carpenters—take their meals same as 2nd or 3rd class of Brahmins.			
MUSSULMEN 1ST CLASS, MEALS TAKEN THREE TIMES A DAY.			
Rice...	...	12	...
Ghee...	...	12	...
Mutton or Beef... . .	...	12	...
Spice	...	..	3
Onions	...	6	..
Curry stuff...... ...	...	2	4
Garlic...	...	...	2
Salt...	...	2	...
Tyre with cream... ...	...	8	...
Wheat flour... ...	1	...	...
Dholl...	...	4	...
Fish...	...	8	...
Tamarind fruit... . .	...	4	...
Eggs... ... No.	...	3	...
Milk...	...	...	...
Vegetable curry... ...	...	8	...
Fowl... ... No.	...	1	...
Chatney...	1	1	...
Pepper-water...	...	6	...
Sugar...	...	1	...
2ND CLASS OF MUSSULMEN.			
Rice...	1	8	...
Salt...	...	2	...
Mutton...	...	4	...
Vegetable...	1	...	..
Ghee...	..	4	..
Pepper-water...	1	...	...
Tyre..	1	...	...
Curry stuff.	...	1	4
Onions	.	3	...
Chatney...	...	1	...
Tamarind fruit... ..	...	4	..
3RD CLASS OF MUSSULMEN.			
Rice...	1	8	...
Fish or Mutton... ..	...	6	...
Salt..	...	1	4
Curry stuff.	...	1	...
Tamarind fruit... ...	...	3	...
Butter-milk. , ...	...	12	...
Onions...	...	...	4
Garlic...	...	...	1
Chatney...	...	...	4

SALEM.

By Assistant Surgeon H. Crocker, M. D.

The habits of the people of this district with reference to their diet vary considerably, and rice, cumboo, raggy, and cholum, may be noticed as the grains which form the staple articles of food. The Salem district is divided into two portions, viz: "Salem" proper and "Baramahal." In the former, rice is used extensively, perhaps more so than other grains, the inhabitants chiefly "Cometies" "and Chetties" being in prosperous circumstances and able to purchase this dearer grain. When rice cannot be afforded, as is the case in Baramahal, the inhabitants being poor, raggy is the grain principally used, whilst "cumboo" and "cholum" are not so generally in use, being confined chiefly to weavers.

II. The *mode of preparation* of those various grains, so as to render them fit for consumption, and adapted to the requirements of Nature, much depends upon the taste, vary very considerably. The first step with reference to all of them is that of being beaten, or pounded in a large wooden mortar, and this is done with a view to the thorough loosening and removal of the husk from the grain itself. This being done, it undergoes a thorough sifting, and in some cases washing, for the purpose of removing the husk or bran as well as dirt and dust.

The subsequent steps differ somewhat according to the grain used, rice for instance is merely washed and well boiled, when it is eaten with vegetable or meat, curry, or "mulligatawny" or pepper-water or milk, or tyre (curdled milk) or whatever the taste of the person may dictate; the water in which the rice is boiled being drunk at the time or after the meal is done. Raggy on the contrary, after being well cleaned by sifting is dried thoroughly to make it grind more easily and to secure its reduction to a fine powder by means of the simple method always adopted. A large quantity of this is ground at a time and kept ready for use. There are two methods of cooking this grain, both of which are in frequent use. The first is when completed, somewhat like thick arrow-root conjee and is prepared as follows:—the fine powder is mixed with a proportionate quantity of *cold water.* It is then placed in the sun and allowed to remain ten or twelve hours. It undergoes during this time slight fermentation and becomes slightly acid and by no means disagreeable to the taste.

Fermentation having been allowed to go as far as is wished, the mixture is then boiled, when it forms a good thick conjee. Rice-flour in small quantity is sometimes boiled with it. This is then called "cooloo," and is a

wholesome digestible and nutritious diet. It is never taken fresh, but is allowed to cool into a jelly and kept for nearly twenty-four hours, and it is then decidedly acid in taste, and this is the favorite way of eating it, a supply is cooked to-day and eaten to-morrow as it were. A second method of cooking this article, and the one generally used by the labouring classes " ryots" and " wudders," perhaps from the fact of its being less troublesome and not so rapidly digested is as follows :—the powder or flour being made ready in a suitable vessel, boiling water is poured on it; whilst it is being rapidly and vigorously stirred round with a wooden spoon until the whole becomes a stiff solid mass like pudding. I believe that the proper way however is to sprinkle the flour into the boiling water whilst it is being stirred, and this is continued until by the heat the greater portion of the moisture has evaporated; it is then removed from the fire, and when somewhat cooled, it is rolled into balls or puddings, the size of a good cocoanut. These are again put into a vessel, and boiling water just sufficient to cover them is poured on them, the vessel is then set aside for twelve hours; by this time the water becomes acidulated, when it forms a pleasant and cooling drink. With the raggy balls or puddings, various things are eaten, such as ghee, or curry stuff, or pepper-water according to taste. This process is called " cullee." This is the mode of preparation of the raggy which is adopted in the jail, where raggy for many reasons is wisely used instead of rice.

The mode of preparation of " cumboo" is different from that of raggy. It must be beaten in a wooden mortar moistened with a little water; so as to make the husk peel off readily, when this is done it is sifted. It is then pounded in the mortar until reduced to powder, and this has to be done in small quantity every time it is required. The process of cooking is similar to that of raggy.

The method of preparing and cooking of " cholum" is in most respects similar to that of rice.

III. Many adjuncts are used with those grains, such as dholl-gram, &c. without reference to either kind of grain, also vegetable or meat soup, ghee, butter-milk or " tyre" occasionally mutton, fish or fowl, according to taste and circumstances.

IV. The quantity of food taken differs materially with the mode of life or occupation. People whose situation in life (Ryots and Wudders for instance) entails upon them heavy manual labor consume per diem on an average ½ a measure or 1½ lbs. of any grain which they habitually use.

Those whose labors are light consume less, from ¼ to ½ measure daily. It will be proper here to compare the above quantities with those consumed in the jail which are as specified below.

Class of Prisoners.	Working Convicts.	Security Prisoners.	Under trial Prisoners.	Women.	Sick.	Children.
Amount in.	Rs. Weight.	Rs. Weight.	Rs. Weight.	Rs. Weight.	Rs. Weight.	Rs. Weight.
Raggy....................	60	50	50	50	45	*none*
Rice......................	65	60	*none*	55	50	20

Rice is given to the prisoners instead of raggy once a week in the Salem jail, and this is done with a view to variety merely and to prevent too great a sameness in diet.

V. With reference to the nutrient value of those several grains, I believe *rice* is generally preferred, being more pleasant to the taste and perhaps more easily assimilated by the stomach, and the people will generally, I believe, have rice if they can afford it; but this is by no means a proof of its greater utility. On the contrary, I am decidedly of opinion that rice without meat (*i. e.*, simply with a few little condiments) is not so well adapted for the requirements of nature as raggy. The staple article of the laboring classes of this district, and one which they use as an article of diet is raggy. Whether from choice or from the circumstance of its cheapness and practical utility, I am unable to say, I should think from the latter; but it is difficult to ascertain this from the people themselves.

The physical condition of those who live upon "raggy," the highly developed state of the muscular system especially, the entire absence of all skin affections, their positive aptitude for any amount of arduous labor, are in my opinion convincing proofs of its utility, and highly nutritious qualities. As a further proof, I may add, that prisoners increase materially in weight shortly after admission to the Salem jail, and that not from the accumulation of loose fat but muscular developement. Every prisoner on admission is weighed and registered, and I have repeatedly been astonished and even amused at improvements in a man's personal appearance. At first on admission, if a convict has not been accustomed to raggy (the higher castes for instance) he may suffer a little temporary derangement in the bowels. From the slightly astringent quality of "raggy," the fat and

bloated Brahmin who has hitherto fed on rice may suffer, though not always, a temporary attack of constipation and even hœmorrhois. At first he looses in weight and importance. One or two administrations of a mild aperient restores the gut to a healthy condition, and he then gains again his lost weight with additional tone, firmness and vigour of body. Many of the ordinary skin affections disappear after a short residence in the jail. Raggy exercises an astringent action on the bowels, whilst "cumboo" on the contrary is a laxative, and it has been observed that the people who live upon "*cumboo*" pass one or two and sometimes more motions daily; whilst those who live on *raggy* do not have a motion every day, and commonly not so often as every third day. I have noticed that "*cholum*" has one peculiarity which the other grains do not possess; viz: that those who live on it solely for any length of time, say for six months, become troubled with skin affections, such as herpes, scabies, &c., and not unfrequently of a very obstinate form. One caste of people in Salem, viz: the weavers live principally on "cholum" and they are proverbially subject to skin disease of almost all kinds, and of itch in particular. It would be interesting to ascertain a proximate cause for this.

TRANQUEBAR (TANJORE DISTRICT.)

By Assistant Surgeon J. M. Joseph, M.D.

The staple article of food used by the inhabitants of the Tanjore district is rice. The food of the Brahmins, as a rule consists chiefly of rice, milk, vegetables, fruit and sugar; the rice is eaten boiled and the vegetables are prepared into curries and stews by the addition of clarified butter and condiments. The Sudras, Mahomedans and Pariahs, in addition to the dietary of the Brahmins consume mutton, poultry and fish cooked into various sorts of soups, curries, stews, &c. The poorer classes can seldom afford meat, and they generally live on rice and vegetables, and use gingely oil (oleum sessame) instead of clarified butter. Butter-milk is also very extensively used by all castes and classes of Natives. The food which they are accustomed to seems sufficient, and they appear to be a healthy set of people.

The diet allowed to prisoners in the Tranquebar jail consists of rice, vegetables and condiments. Sixty-five Rupees weight of raw rice is issued to convicts sentenced to hard labor, sixty rupees weight to security and female prisoners, and fifty-four rupees weight to sick prisoners and those under trial. The above rations are I think sufficient in quantity in jails situated in healthy localities, and do not seem to have any injurious effect

on the health of those convicts who belong to the laboring classes, indeed I think, the food which they get in our jails is superior both in quantity and quality, to what they have been in the habit of consuming when at liberty; but convicts who have previous to their incarceration been in the habit of using meat, clarified butter, &c. generally suffer more or less in health, but the Medical Officer in charge of the prison has discretionary power of ordering improved diet to those who in consequence of ill health may appear to require it. The amount of food which individuals of the laboring and other classes actually consume, is I imagine, not greater than that allowed to prisoners.

TANJORE.

By Assistant Apothecary A. Saviel.

Rice forms the principle food of the Natives residing in the town of Tanjore; but at this time of scarcity the middle and poor classes resort to inferior grains in order to relieve themselves from hunger, though they do not entirely subsist on them; the consumption of the dry grains therefore is a casual occurrence and a deviation from their ordinary diet which as before told is rice. I have on this account not included in the appended scale of diet dry grains as constituting the food of those residing in the town and vicinity of Tanjore. In the villages remote from the town however, dry grains form principally the food of the labouring and industrious classes, rice being only used on particular occasions, such as new moon, festivals, fasts, &c. I do not see any difference in health as enjoyed by the town and village populations, or in other words, between those that live on *higher* and those on *inferior* grains,* they enjoy equally. The health of the prisoners of the Tanjore jail as a body is not satisfactory, many of whom are in an anemic and debilitated condition, and require to be supported by animal food. The dietary in use is certainly expensive from being composed of grain of a higher value, but it remains to be seen, whether a change in the present system by the substitution of other grains could be effected with any manifest advantage.

---

* The popular idea that the dry grains are *inferior* to rice, it will be observed is held by some Officers of the Medical Establishment.—W. R. C.

Scale of diets of the laboring population of the district of Tanjore as compared with that of the jail.

	Nature of food.	Meals Specified.			Total quantity of grains.	Cost.			Remarks.	Jail diet.
		Breakfast, quantity and how cooked.	Dinner, quantity and how cooked.	Supper, quantity and how cooked.		RS.	A.	P.		
Town and Vicinity.	Rice......	¼ Tanjore measure cooked overnight and eaten cold.	¼ Tanjore measure cook- anew and eaten with curry.	½ Tanjore measure cooked anew and eaten with curry.	1¼ Tanjore measure.	...	2	6	Rice being only used on particular occasions, such as new moon, festivals, fasts, &c. Curries are made of vegetables, mutton or fish with condiments in certain proportions, vegetables being in general use as they are cheaper, the cost of a curry on an average being reckoned at 4 pies.	Each working prisoner is allowed daily one measure of rice equal to 65 Rupees weight and 4 pies for curry, &c. divided into two meals, the cost per head daily being 2 annas and 4 pies.
Villages remote from town.	Raggy	⅜ measure made into a paste overnight and eaten with curry or butter-milk& atchar.	¼ measure made into a paste overnight and eaten with butter-milk or simply with atchar.	⅜ measure made anew into a paste and eaten with curry.	1 Tanjore measure.	...	1	...		
	Cholum.....	do.	do.	do.	do.	...	1	...		
	Cumboo....	do.	do.	do. eaten with pepper-water or curry.	do.	...	1	...		
	Varagoo.....	¼ measure cooked overnight and eaten as above.	½ measure cooked overnight and eaten as above.	½ measure cooked anew and eaten with pepper-water or curry.	1¼ Tanjore measure.	...	2	1		

TELLICHERRY.

Statement of the nature and amount of food of the labouring population of the district as compared with the dietary scale allowed for the prisoners in jail at Tellicherry.

	Caste of Prisoners.	Nature of food in jail.	Nature of food in the district.	Remarks of the Medical Officer on the influence of diet in producing disease or prolonging health and life.
By Assistant Surgeon M. C. Furnell.	Brahmins. Cherameous... Moplahs....... Mussulmen. ... Nairs.... ... ... Paniars. ... ... Pariahs........ Poleyars. ...... Tamil. .... Teers	The prisoners working outside on hard labour get 65 Rupees weight, those working inside on light labour 60 Rupees weight and those under trial 54 Rupees weight of rice, and all $3\frac{1}{2}$ pies each for providing vegetables, fish, curry stuff, firewood, &c.	Live upon rice, fish, meat, vegetables, &c. The amount of food consumed daily by the laboring class varies from 50 to 90 Rupees weight of rice. No correct quantity of fish, vegetables, &c. used by them can be ascertained, since the consumption of these articles is discretionary, and arranged according to the means and pleasure of each of them.	Men of good caste on coming into prison are very apt to fall sick with dysentery and diarrhœa, which they attribute to the change of diet, especially the difference in the quality of their rice; but in time they become accustomed to it. To the lower classes the food seems all that is requisite, and much better in many cases than they are in the habit of obtaining for themselves when out of prison. Their health, if good on admission seems rather to improve than deteriorate in prison.

TINNEVELLY.

By Assistant Surgeon J. D. Gillies, M.D.

I have now the honor to submit the following brief statement from information derived from the jail records, and from respectable Natives in the town of Palamcottah and Tinnevelly, amongst whom were two very respectable native gentlemen* of the district. It was my intention originally to have embodied in it information for which I had applied to the Collector, (on the 26th January 1862,) soon after the receipt of the circular, but which has not as yet been furnished.

2. The staple article of diet for the convicts in jail is cumboo, a small grain containing a great proportion of gelatinous matter. It is furnished raw, and in weight equal to Rs. 60. In addition to this, $3\frac{1}{2}$ pies are allowed for each convict, with which they supply themselves with condiments, greens, &c.

* Zemindar of Cuddamboor, son of the late Zemindar of Yettiapooram.

according to each man's own liking; except when the Medical Officer suggests the issue of rice, (on the prevalence of diseases amongst them), in which case the grain is issued raw, equal in weight to Rs. 65 with the usual 3½ pies for condiments, &c. per day for the number of days recommended.

The labouring classes throughout the district also use cumboo as the staple article of their food during the greatest portion of the year. They also use "raggy," "cholum," "shammy," "kaddacunny" and paddy; when employed in reaping each of these grains, instead of being paid in money, they receive a moiety of the grain they gather. This it will be observed affords them an occasional change of diet, but the quantities vary in different taluqs of this district; thus, in the Cuddamboor Zamin, the average daily allowance of cumboo to the laborer is by weight equal to Rs. 111, while in the adjoining Zamin of Yettiapoorum it is only Rs. 74 by weight. No reason whatever is advanced for this marked difference, and there is no striking difference in the physical appearance of the laborers in the Zamins abovenamed; but it is stated that cutaneous diseases and leprosy prevail in the Cuddamboor Zamin, while small pox, guinea worm, and bowel complaints are noticed in Yettiapoorum. I must here remark that the latter Zamin is situated nearer the sea than the former. I should here observe that the cumboo grain is with very great difficulty cleared of its husk, and requires more than double the time to cook to proper consistence than rice.

The difference of quantities of the cumboo grain allowed to the convicts on the one hand, and the laborers on the other, is I think, easily explained; the endeavour of the former, there can be little doubt is to do as little work as possible, while the object of the latter is to work to the utmost of his power for the support of himself and in most cases for that also of his large family. It has been stated that amongst the laboring class the liking for cumboo grain is so great that were any to offer a labourer rice he would at once express his preference to the cumboo, asserting it to be the most satisfying.

TRICHINOPOLY.

By Garrison Surgeon, J. Dorward.

The diet of prisoners in the jail at Trichinopoly consists daily of sixty-five Rupees weight of good rice each, with half a pie worth of curry stuff, of salt, and tamarind, of dholl, of vegetables, of butter-milk, and of mutton, respectively. These are cooked twice a day, and eaten warm morning and evening before going to and on returning from work. In addition, two and a half ounces of mutton

16

is allowed to each prisoner once in a week on Sunday. An extra allowance of mutton is given to sickly and weak prisoners at the discretion of the Medical Officer in charge. This scale of diet proves abundant and wholesome, and is similar to that in general use by the labouring classes of the district, boiled rice with condiments being their staple article of food. Animal food or fish can only be obtained occasionally by the great mass of the people here. They are not so fine a race physically as those men who eat wheat or raggy, but they are decidedly more intelligent.

VIZAGAPATAM.

By Assistant Surgeon C. A. Andrews.

I. Working prisoners are allowed 1 lb. 10 ozs. of rice and 3½ pies batta, with which they purchase firewood, tamarind, salt, chillies, mustard, garlic and gingelly oil, which compose their curries. They also occasionally purchase various kind of vegetables, fresh and salt-fish, butter-milk or tyre, and once a fortnight ½ lb. of mutton.

Sick prisoners are allowed 1 lb. 6 ozs. of rice, and 2 pies for the purchase of the articles abovementioned, and are supplied with mutton, arrack, &c., whenever the Medical Officer considers it necessary.

Diet of the labouring classes.

II. Consists principally of cholum, raggy and cumboo, they also mix several varieties of grain with their curries, a list of which will be given below. The poor of the town and its vicinity live chiefly upon cumboo, the least nourishing of these articles of diet; it is parted from the husk by pounding and boiled till it forms a porridge, from 1 to 2 lbs. is taken for a meal, and it is eaten with a curry made of gangoora leaves, (canabis sativa), raw chillies, brinjalls, melons and other vegetables. Raggy is the chief food of the hill tribes, it is made into flour, which is steeped in water, till it acquires acidity, then boiled to the consistence of gruel—the gruel thus made is mixed with butter-milk and eaten with vegetable curries, 1 pound of the grain is about the average quantity for a meal. Cholum is not much used in this district, it is considered more nutritious than raggy or cumboo, and is prepared in the same way as the latter. These people with the exception of those living in large towns are at little expense for anything beside the grain, as they cultivate the vegetables and cut the firewood from the jungles.

Diet of the wealthy and trading classes.

III. Mahomedans partake freely of fish and flesh, wheaten cakes and vegetables, and moderately of rice.

Brahmins' diet consists of rice, dholl, green vegetables, milk, and ghee in abundance.

Banyans' diet much the same as Brahmins, but consume a greater variety of grains, and less rice.

Hindoos of other castes eat moderately of fish and flesh, rice, dholl and other grains, vegetables and butter-milk.

Pariahs eat whatever they can obtain ; some of them are rich and live well, but the poor live upon bad flesh, putrid fish, and the cheapest kind of grains.

List of the principal grains used as diet arranged according to their relative nutritious qualities.

IV. Wheat, Indian corn, rice, cholum, dholl, millet, raggy and cumboo. The undermentioned are consumed in small quantities chiefly in curries. Chenna, diskalloo, caraloo, boboloo, candaloo, green-gram black gram, annamoloo, minnamoloo, (species of beans) and gingelly oil seed. It would occupy too much space to describe all these, but specimens of each can easily be procured.

Health of the population and its dependence upon diet.

V. The prisoners suffer much from diarrhœa, dysentery, fever, and the anemic condition commonly called beri-beri, and any epidemic visiting the district falls with great severity upon them, the mortality among the sick is considerable. Their cases generally resist ordinary treatment, and even stimulants with the most nutritious diet fail to restore their stamina when sick. It will be gathered from previous remarks, that they are better fed than the laboring classes, they are well-housed and have the advantage of medical treatment the instant they become sick. Notwithstanding they are far less healthy, and suffer a much larger mortality than those classes. They are not generally subject to elephantiasis or leprosy, most of them being inhabitants of the interior ; the mortality is greatest among the Khonds or Hill-men, usually amounting to ten or twelve per cent. per annum. Last year during the prevalence of cholera it amounted to 40 per cent. I attribute the great mortality among them to depression of mind, and the practice of opium-eating, in which most of them indulge before incarceration. The laboring classes are most prone to fever and rheumatism, the mortality amongst them is not large, and they may be considered a healthy, though not a fine race. Elephantiasis, leprosy, beri-beri and hydrocele are endemic in the district, but the first mentioned disease is almost confined to the towns and villages adjacent to the sea. Leprosy and beri-beri are also much more frequent within a few miles of the coast. I consider the prevalence of those diseases is

to be attributed to the saline atmosphere acting upon consitutions debilitated by insufficient nourishment and other causes. Elephantiasis exists among all classes of Hindoos, but principally attacks those who lead a sendentary life, such as the Banyans and also the very poor ; leprosy is found mostly among the poor. Those who feed upon putrid fish are, I believe, most subject to it. I also think that it is hereditary, but its victims are very unwilling to confess to its being a family disease ; I have seen lepers among Brahmins and people in good circumstances. Beri-beri exists among all classes, but predominates among the ill-fed. Hydrocele is more common among Brahmins and the wealthier classes. Mahomedans are almost exempt from these diseases, and cases are very rare amongst Europeans.

Concluding Remarks.

VI. I reget to say that the practice of opium-eating is on the increase, about one-third of the population indulge in it, and when any epidemic appears, especially cholera, these people are its most frequent victims. It will appear from this report as might naturally be expected, that the best fed classes are most exempt from disease; that the endemic diseases are attributable to peculiarities of climate rather than to diet, which however from being principally vegetable, seems by lowering the physical powers, to have also a depressing effect on the intellect of the natives, making them very apathetic and slow to receive new ideas, while at the same time it renders them less susceptible to the pain and inflammation usually attendant on wounds and injuries.

Statement of the nature and amount of food of the laboring population of the Vellore district as compared with the scale of diet of the prisoners in jail.

	DIET OF PRISONERS.	NATURE AND AMOUNT OF FOOD OF THE LABORING CLASSES.	
		Hindoos.	Mahomedans:
By Surg. Major H. Goodall.	Consists of daily allowance of 33 Rs. weight of raggy and 22 ditto of rice. There is also an allowance of 4 pies per diem for the purchase of mutton, vegetable, firewood, salt, pepper, chillies, dholl and munghool. The rice is boiled and eaten with salt or pepper-water, or with vegetable or mutton curry. The raggy is either boiled or made into cakes. The above allowance of food is considered to be amply sufficient, and that it is so is manifested by the good condition and healthiness of the prisoners. One or two of them have made complaints to me of its insufficiency, but I am disposed to believe that it was put forth merely as a grievance, the quantity having been slightly reduced some months since.	Rice, raggy, cholum, cumboo are the cereals used and esteemed in the order set down; mutton or fish once or twice a week, and vegetables daily. The average quantity of grain considered necessary for a laboring man is $\frac{3}{4}$ of a measure (154 Rupees weight) of raggy, cumboo or cholum, or one measure of rice daily, vegetable $\frac{1}{2}$ seer daily, of mutton or fish $\frac{1}{2}$ seer. The above estimate when compared with the dietary scale of the prisoners is high, and should seem to be rather the maximum that the most compacious stomach can consume. Raggy, cumboo and cholum are either boiled or baked. Rice consistutes the favorite evening meal, and raggy the mid-day one. The condiments and other accompaniments are the same as the prisoners, and vary according to the individual's means.	In addition to the grains noted in the second column, wheat enters largely into the diet, as does also animal food when the individuals can afford it. The quantity consumed per diem is $\frac{1}{2}$ measure of wheaten flour or of any one of the other grains; $\frac{1}{2}$ seer of butcher's meat, or fish 3 or 4 times a week, and a due proportion of vegetables. The wheaten flour is made into a paste with water and fashioned into somewhat thick cakes and baked on a hot iron plate. The other articles of food are cooked much in the same way as the Hindoos prepare theirs, but the Mussulmen pay much more attention to the cookery, are more nice, and partial to variety.

With reference to the 2nd para. of the Circular Memorandum, No. 2,260 "on the influence of diet in producing disease and prolonging health and life," I have to observe that the healthy state of the prisoners shews that their diet is such, together with the concomitants of comfortable quarters, easy labor, &c., as to preserve health and thereby prolong life.

The Hindoo and Mahomedan population of the district are said to be remarkably healthy, a circumstance mainly attributable to the goodness of the climate, and to the influence of good and abundant food. The climate is considered to be highly salubrious; the temperature throughout the year being pretty equable, and the air generally dry. The five kinds of cereals in

general use are cheap, with the exception of rice, which owing to unusual drought has risen in price this season. Animal food, chiefly mutton is abundant and moderately priced. It is this cheapness of food, which in a great measure renders the district the favorite resort of a large body of Pensioners, whose comforts and prospects of longevity are enhanced thereby. There is no particular endemic disease in the district. How far the health of the population is influenced by their diet alone, I have no means of ascertaining; but good, cheap and varied vegetable and animal food must here as elsewhere conduce to health and prolonging of life.

Of the influence of food in producing disease or predisposing to it, my experience and observations have been mainly confined to the Native Military classes and their followers; among these much sickness is at times induced by insufficient or poor food, by the use of only one description of cereal as the main article of diet, by the not uncommon practice of making a morning meal off the stale remains of food cooked the day previous, and by a too sudden change from one kind of cereal to another.

CORRESPONDENCE IN REFERENCE TO THE INSUFFICIENCY OF JAIL DIETS.

Extract of letter from Assistant Surgeon S. J. Wyndowe, M.D., Civil Surgeon, Calicut.

As it appears to me that the large average mortality and increasing prevalence of disease occasioned by defective nutrition, which obtains in the Calicut jail is due in a great measure to the defective diet, I have been at some trouble in compiling a diet table more in accordance with the scientific principles of the present day, as detailed in some remarks in a report to Sir J. McNeil, relative to rations for Soldiers by Dr. Christison of Edinburgh, wherein in para. 3 it is stated, "Experience has shewn the most successful dietaries for bodies of men deduced from practical observations, contain carboniferous and nitrogenous food in the proportion of about three of the former to one of the latter by weight." Now, the diet of the prisoners in the Calicut jail consists almost entirely of carboniferous food, "although nitrogenous food may replace at a great loss carboniferous as a supporter of respiration, yet it is certain that carboniferous food cannot replace nitrogenous for repairing textural waste."

The diet tables herewith submitted for approval have been framed by me in compliance with the above, and contain the constituents of food nearly in the proportion laid down by Dr. Christison.

I append also the cost of each diet calculated at the bazaar rates; doubtless this might be supplied by a contractor at lower rate, and in that case but little additional expense would accrue to Government.

If these diet tables are approved of, I trust they may be adopted as soon as possible, and I would beg permission to suggest, that a set of scales and weights might be supplied, and selected prisoners weighed at intervals, a register being kept, which at the end of the year might be made available as a test of the efficiency or otherwise of the new diet.

Proposed diet table to be adopted in the Calicut jail.

No. of class.	Denomination and class of prisoners.	DAILY ALLOWANCE.									Remarks.
		Rice.	Dholl.	Fish, 5 times a weak.	Vegetables, twice a week.	Oil.	Salt.	* Condiment.	Tamarind.	Firewood.	
		oz.	oz.	oz.	oz.	oz.	oz.	oz.	oz,	lbs.	
1	Prisoners under sentence of labour........	16	8	12	6	$\frac{1}{2}$	1	$\frac{3}{4}$	$\frac{1}{2}$	1	* Chillies, 2 drachms, turmeric, 1 drachm, onions, 1 drachm, gooseberries, 5 drachms.
2	Prisoners under examination, non-labourers, women, boys under 15.	12	6	12	6	$\frac{1}{2}$	1	$\frac{3}{4}$	$\frac{1}{2}$	1	
3	Prisoners under $1\frac{1}{2}$ month.......	10	5	12	6	$\frac{1}{2}$	1	$\frac{3}{4}$	$\frac{1}{2}$	1	

Cost of No. 1 diet on fish days	As. 1	$6\frac{5}{12}$
do. on vegetable days	1	$6\frac{11}{12}$
„ of No. 2 diet on fish days	1	$2\frac{10}{12}$
do. on vegetable days	1	$3\frac{4}{12}$
„ of No. 3 diet on fish days	1	$\frac{2}{12}$
do. on vegetable days	1	$\frac{8}{12}$

The above diets from calculations based on analyses made by various Chemists and published in Dr. Pereira's Materia Medica contain on fish days the elements of food in the proportion of 41·761 carboniferous to 16·6 nitrogenous, and on vegetable days 41·761 carboniferous to 10·93 nitrogenous, a mean of carboniferous food of 41·761 to nitrogenous, 13·76; the correct proportion according to Dr. Christison would be carboniferous 41·475 to nitrogenous 13·92.

From Acting Deputy Inspector General of Hospitals, W. Mackenzie, Mysore Division, to the Secretary Principal Inspector General Medical Department, Fort Saint George.

In transmitting for the information of the Principal Inspector General, transcript of letter from the Civil Surgeon, Malabar, to the Civil and Sessions Judge at Calicut, advocating a change in the diet of the prisoners in the jail at that station, "I have the honor to state that from what I witnessed on my recent tour of inspection of the low, enfeebled, scorbutic state of health of a very large proportion of the patients in hospital and the men under confinement, I quite concur in opinion with Dr. Wyndowe, that the increasing prevalence of disease and large average mortality in the Calicut jail are mainly attributable to the defective diet hitherto in use, and hence the necessity there is for the introduction of the improved dietary he recommends."

Referred to the Chemical Examiner for early report with reference to his analysis of Indian food grains.

By order.

W. R. CORNISH,

Secy. Principal Inspector General.

From J. Rhode, Esq., Inspector General of Jails, to the Principal Inspector General, Medical Department.

I have the honor to request your opinion on the introduction of a more uniform rate of diet in the jails of this Presidency.

The marked improvement in the health of prisoners where raggy when thoroughly boiled forms the staple food, and the great mortality in gangs transferred from a diet partly or in whole of millets to one of fine rice, induce me to adopt in all districts where raggy and cholum are grown, one of these grains as the staple food.

In those districts in which rice is now the ordinary food of the people, it might be used in a larger proportion, and in those districts in which the dry grains form the chief food of the labouring population, or in which the jail dietary is already in the main dry grain, the use of rice might be restricted to one or two meals in the week as at present.

I have observed a constant tendency on the part of several Medical Officers of jails to resort to the more expensive but less nutritious rice diet, and on the other hand I have observed that the introduction of the dry grain dietary has in no case in which care has been taken in the preparation

of the food been attended with any deterioration in the health of prisoners; while on the other hand the effect of recourse to a rice diet has in many cases induced the belief that it induces a tendency to beri-beri and other dropsical affections, or perhaps I should say does not induce stamina to resist them.

The new Salem jail is one in which the perseverance in a raggy diet has been attended with most favorable results. Rice is there given in lieu of raggy on one day of the week.

The same course was followed when I was in charge (for four years) of the Guntoor jail, cholum being issued on six days, and rice on one day in the week.

I find that in Tinnevelly, Mr. Gillies has insisted on a rice diet in lieu of cumboo. At Rajahmundry, cholum had been discontinued, and a rice dietary introduced and persisted in, but in no case that I can call to mind has the health of prisoners improved under a permanent change to a rice diet.

The Chittoor and Vellore prisoners have been reduced from a full rice diet to a dietary of 35 Rupees weight of raggy and 20 Rupees weight of rice. The health of the prisoners at this place (Waltair) has so much improved since the introduction of the raggy for the morning meal, that the Zillah Surgeon has been induced to concur in the adoption of the Chittoor scale with the addition of 5 Rupees weight of meal of dholl, green-gram, or black gram to be made into mulligatawny for the evening meal.

In proposing a change of diet, I have in view not only the health of the jails, but the reducing of the prisoners to a dietary more suited to their condition than that with which they are now indulged, and the reduction of cost in this very heavy item of prison expenditure; reductions have already been made in several of the jails by recourse to the dry grain diet, and in others as Guntoor, Kurnool, Bellary, Cuddapah and Salem—the usual practice was to issue the cheaper grains, whether cholum or raggy; at Rajahmundry and Tinnevelly there has been unauthorized resort to the more expensive rice-diet. At Chittoor, Vellore, and now at Vizagapatam, the mixed daily dietary of 35 Rupees weight of raggy and 20 Rupees weight in rice has been resorted to, and I may here mention an expedient adopted by Mr. Andrews, the Zillah Surgeon of making cakes of dough, of raggy meal and whole wheat flour for the Hill prisoners in hospital, to whom pure wheaten bread had formerly been given, as worthy of adoption.

The weight of cholum issued to each prisoner at Coimbatoor, namely, 80 Rupees weight I have always considered excessive. It is in my opinion

an error to resort to the fine white garden (irrigated) cholum, as was the practice at Coimbatoor, but which experience in Guntoor condemns. This I believe, the Officer in Medical charge is now convinced of. I have always had hesitation in meddling with the dietary of that jail, which is and always will be unhealthy in spite of all the skill and attention that successive Medical Officers have bestowed on it.

The ordinary dietary proposed for all jails now on rice, except those on the western coast is

Raggy, 35 Rupees weight or cholum 40 Rs.

Rice, 20 Rupees weight.

Meal of dholl, green-gram, or other legume, 5 Rs. weight, condiments, &c. at the present rate at the discretion of the Officer in medical charge.

I do not propose at present any change in the diet of the Guntoor, Kurnool, Cuddapah, Bellary, and Salem jails. In the four first, the dry grains are the ordinary staple food of all classes, and in the latter the prisoners have proved so healthy on the present raggy diet, that no change is called for.

From the Principal Inspector General, Medical Department, to J. Rhode, Esq., Inspector General of Jails.

No. 910 of 27th March 1863.

Referring to your letter as per margin, I have the honor to observe that it seems expedient to introduce a more uniform dietary for prisoners in jail, arranging the ingredients of the diets more in accordance with scientific principles than has hitherto been the case.

With this object I have referred a communication from the Civil Surgeon, Malabar, proposing a new scale of dieting, to the Chemical Examiner for report, and when I am in possession of his views I shall do myself the honor of communicating with you again on the subject. In the meantime your proposed scale of diet will also be referred to him for report, as to the proportions of nitrogenous and non-nitrogenous food in the grains proposed to be used.

The great error in most of the Indian jail dietaries is the excess of carboniferous material and the deficiency in the nitrogenous. The general use of rice is for this reason objectionable, and I concur in your views that the dry grains, or a proportion of dry grains would be far preferable, not only as an economical arrangement, but also to prevent that deterioration of health which is but too common in most jails.

Medical Officers are often compelled as a precautionary measure increase the diet and order animal food, because the jails are over-crowded, and the bodily powers of the prisoners are becoming enfeebled by the depressing effects of vitiated air, and thus rendered prone to become victims to miasmatic disease should it break out. A more liberal diet will always be required in such cases, than when the space allotted to each prisoner is ample.

Report of J. Mayer, Esq., Chemical Examiner to Government.

I have the honor to acknowledge memo. 946 from your office, transmitting letter from the Inspector of Jails, No. 910, together with reply, No. 923 from the Principal Inspector General.

I have also to acknowledge a former memo. requesting a report on the subject of food for prisoners, forwarded with letter from the Acting Deputy Inspector General of Hospitals, Bangalore, in reference to copy of one from Assistant Surgeon Wyndowe addressed to the Civil and Session Judge, Calicut, on the subject of diet for prisoners. I have read with attention all the papers above referred to herewith returned, and in answer to the request preferred by the head of the department regarding them, I beg to submit the accompanying report.

REPORT ON DIETARIES IN REFERENCE TO THE RELATIVE PROPORTIONS OF HEAT-GIVING AND FORMATIVE OR REPARATIVE MATERIALS.

The type of all food is the milk of the animal spoken of, thus of the human species, human milk affords this type.

Average of 14 analysis of human milk made by Simon. In 1,000 parts given.

Water...	883·6	The solids vary from about 86 to 138·6. The analysis given is the mean merely of many others.
Butter	25·3	
Casein...	34·3	
Sugar of milk and extractive matters	48·2	
Fixed salts	2·3	

These salts are identical with those found in the blood, the phosphates of lime and magnesia being somewhat in excess. These phosphates are held in solution by the casein. Iron is also present as phosphate, with the chlorides of potassium and sodium, in short all that is needed to the building up of the tissues.

The conditions under which the females are placed cause the proportions of the constituents to vary, thus rest, warmth, and oily matters in the food

increase the quantity of butter ; while exercise and cold eliminate part of the oily matter in the form of carbonic acid and water, and increase the proportion of casein. Time also is an element in the calculation. At the commencement of lactation, there is a small amount of casein, but this gradually increases till its proportion attains a maximum. The quantity of sugar, is on the contrary greatest at first, it afterwards gradually diminishes.

The three classes of substances required for human food, viz : the albuminous, oleaginous, and saccharine, exist in this fluid, and it is the only fluid manufactured in the organism in which this combination does exist. With the amount of water given, it is admirably adapted to all the wants of the young animal, and all artificial combinations of food are suitable only so far as its character is imitated.

If we examine physiologically the constituents of milk, we find *water* to allow of easy and free motion among the particles in the various animal fluids, as well as to afford its aid in the various changes to which the numerous organic compounds under formation, and undergoing disintegration are subject continually. *Sugar* and *butter* to afford the means of keeping up the animal heat with the aid of the oxygen of the inspired air, *casein* to be converted at first into albumen and fibrine by the powers of the organism into which it is taken, and subsequently into living tissue. *Saline compounds* to confer on the animal fluids certain powers and properties which without such ingredients they do not possess. *Iron* for the blood, *lime* for the bones, and so on. The uses of the constituents of this fluid having been glanced at ; it is worth while to see what proportions they bear one to the other. Sugar and butter, the ingredients which support animal heat are found in 100 parts of the solid constituents of milk to be as follows :—

Butter	22·7	Casein	31·0
Sugar, &c.	44·2	Salt...	2·1
	66·9		33·1

Or in the rough, two parts of heat-giving to one of plastic or nitrogenous matters.

These however are the proportions in which the solid ingredients stand to each other in the compounds offered and prepared by nature for the young and growing animal, at the time when a larger amount of plastic and formative material is required than in after life, when only the waste of the tissues is to be repaired ; therefore it is necessary to correct the results thus arrived

at by some other enquiries and calculátions, and finally to bring the teachings of experience to bear on the results obtained from the data afforded by analysis.

With this view it is neecssary to examine the matter more closely than can be done by accepting Simon's figures as they stand, or to express the fact more clearly, it is necessary to ascertain what sugar, butter, and casein are composed of.

Ordinary sugar has the formula C_{12} H_{11} O_{11}, *i. e.*, 12 equivalents of carbon are combined with 11 of hydrogen and 11 of oxygen, the two latter being in the proportions that constitute water, or if we speak of sugar as a means of supporting animal heat (the hydrogen being already oxidised, there are 12 atoms of carbon available for this purpose. The sugar of milk differs from ordinary sugar only, in having one more atom of water, the formula C_{12} H_{12} O_{12} expresses this difference, but both are the same in reference to their power of affording heat whenever their carbon combines with oxygen. Whatever amount of sugar is taken into the system it passes out in the form of carbonic acid and water. Butter is a very complex substance composed of several species of fats ; the principal of these is palmitin, a solid fat which is really an acid united to a peculiar sweet substance, acting as a base, known by the term glycerin. The formula of glycerin is $C_6.$ $H_8.$ $O_6.$ and palmitic acid, that of $C_{32}.$ $H_{31}.$ O_3; thus it is evident that this substance is capable of supplying a very great amount of carbon and hydrogen for oxidation, so affording heat-giving materials in great excess. All the other fats present in butter are similar in constitution to palmitin. They are all acid compounds of glycerin, and all have carbon and hydrogen in larger proportion above that which can combine with the oxygen already present in the compound.

The following list of substances with their respective formula will make the foregoing observations intelligible.

			Formula.	
Solid Palmitin..........	Palmitate of	glycerin	$C_{32}.$ $H_{31}.$ $O_3.$	$C_6.$ $H_8.$ $O_6.$
Butin..............	Butate.........	do.	$C_{40}.$ H_{37} $O_3.$	
Olein.............	Oleate.........	do. *	$C_{36}.$ $H_{33}.$ $O_3.$	
Burtyn............	Butrate... ...	do.	$C_8.$ $H_7.$ $O_3.$	
Caproin...........	Caproate... ...	do.	$C_{12}.$ $H_{11}.$ $O_3.$	
Caprylin..........	Caprylate... ...	do.	$C_{16}.$ $H_{15}.$ $O_3.$	

It is thus evident that every constituent of butter consists of carbon, hydrogen, and oxygen only, and that the heat-giving elements are in enormous

* The determinations are Vaventrap's

excess of the amount required to satisfy the combining power of the oxygen present ; one instance will suffice to prove this.

Palmitin or palmitate of glycerin...	$C_{32}.\ H_{31}.\ O_{3}.$	
	$C_{6}.\ H_{8}.\ O_{6}.$	
Number of atoms present...............	$C_{38}.\ H_{39}.\ O_{9}.$	The total
(deduct).........................	,, $H_{9}.\ O_{9}.$	water
	$C_{38}.\ H_{30}$,,	remain

uncombined and available as heat-giving materials. In like manner, every compound of butter will afford an excess of carbon and hydrogen above that required to satisfy the combining power of the oxygen present, and the final deduction from these details is that butter like sugar, affords a large excess of materials that give out a definite amount of heat according to the weights that may combine with oxygen.

The formula for casein like those for albumen and fibrine (its congeners) is not well established. Owing to the great difficulties attending its determination, it has not indeed been possible up to the present time to ascertain positively, what is the combining weight or equivalent of any one of these compounds. Numerous attempts have been made, but the results obtained do not agree, therefore all that can be done with certainty is to state, what substances are present in casein. These have been determined to be carbon, hydrogen, nitrogen, oxygen, sulphur, phosphorus, besides small amounts of lime, &c. and the proportions of these elements in one hundred parts of casein, albumen, and fibrine are as follows :—

	Carbon.	Hydrogen.	Oxygen.	Nitrogen.	Sulphur.	Phosphorus.
Albumen ...	54·46	7·20	18·27	16·48	2·16	·43
Casein... ...	54·66	7·15	21·55	15·72	·92	·0
Fibrine ...	54·45	7·07	19·35	17·21	...	·30

The above are Mülder's figures, and have in several small amounts received correction from numerous experimenters ; but as they are quite independent of any theory regarding Protein, and are merely the expressions of determinations obtained by several chemists, they are quite sufficient for the present purpose, which is to shew that a large amount of heat-giving elements are present in these nitrogenous compounds, and that by regarding the

weight of casein given by Simon in his analysis of milk, as expressing the weight of a compound capable of fulfilling merely the function of forming or repairing tissues without being able to afford heat, whenever the tissue so formed or repaired breaks up, would be to fall into a very serious error. The only special difference with respect to supporting animal heat in the behaviour of these nitrogenous compounds, and the sugars, starches, alcohols, &c. is that the compounds first named serve primarily a purpose more important if possible than that of preserving animal heat, and that it is only after they have served this primary object that they can assist in maintaining the second, and that more or less time elapses before they do subserve to it.

Bearing these various conditions in mind, it becomes necessary to correct the figures set down as representing the weights of heat-giving materials on the one hand, and those representing plastic or formative ones on the other, by determining the proportions that the entire weights of carbon and hydrogen bear to the other materials. Thus if 100 parts of casein contain 15·72 of nitrogen, then 31· will contain x=4·87, and again if 100 parts of casein contain 54·66 carbon and 7·15 of hydrogen, then 31·0 parts of casein will contain respectively carbon 16·94, hydrogen 2·21, sulphur 31, and oxygen 6·68, and finally, if these figures are added to those already given by Simon, calculated on percentages, we shall have the following numbers. Butter when the constituents are ranged under the heads of C. H. O. gives the following figures, *i. e.*, if we accept Berard's analysis.

Butter ...	C.	65·6
	H.	17·6
	O.	16·8
		100·0

i. e., One hundred parts of butter contain 65·6 carbon, 17·6 hydrogen, and 16·8 of oxygen, therefore in 22·7 parts of butter, we shall have

Carbon......	14·95
Hydrogen...	4·01
Oxygen......	3·82
	22·78

Lastly, we have 44 parts of sugar of milk. Prout gives the following figures to represent the composition of milk sugar in 100 parts, C_{40}. H_{30} O_{31}, and if we accept the determination of the percentages, then 44 parts must contain

Carbon........................	17·60
Hydrogen......	13·20
Oxygen.................... ..	13·20
	44 00

But if we wish to curtail these figures, allowing that the formula for milk sugar is C_{12}· H_{12}· O_{12}·, we may see that if 36 parts of milk sugar contains 12 of carbon, then 100 parts will contain 33·3 and so on; but this only shews that Prout regarded the amounts of H. and O. as less than that of C. Perhaps by his processes for drying, he deprived sugar of a portion of water; at any rate the error when calculated on the 44 parts is not very striking, since the numbers will then be $C_{14\cdot65}$· $H_{14\cdot65}$· $O_{14\cdot65}$·$=_{43\cdot95}$. and these figures are probably to be preferred as more in accordance with the science of the day.

We have now reduced the original figures obtained by Simon to percentages of carbon and hydrogen, nitrogen, oxygen, sulphur, phosphorus, and distributed amongst the several headings given, they stand as follows, 100 parts of the solids in the milk being taken.

Butter stands...............	22·8
Sugar..............................	44·0
Casein..............................	31·0
Salts..................................	2·1
	99·9

One hundred parts of the solids in milk will therefore bear the following proportions relatively, and the proximate constituents will contain the respective amounts of elementary substances set down.

Butter...............	22·8	C.	14·95
		H.	4·01
		O.	3·82
Sugar of milk.....	44·0	C.	14·65
		H.	14·65
		O.	14·65
Casein..............	31·0	C.	16·94
		H.	2·21
		O.	6·68
		N.	3·87
		S.	·31
		P.	·00
Salts..........................			2·10
			98·84

If the decimals had been carried further, it is quite evident that the calculations would have approximated to the 100 parts very closely.

The account will then stand thus: at the time of taking the food, 31 parts of plastic materials are taken into the system with 66·8 of materials capable of

supporting animal heat, but after an unknown period 16·94 additional parts of carbon, 2·21 more parts of hydrogen are made available for the latter purpose, by the disintegration of the tissue into which the casein was gradually converted by the vital actions going on in the living organism ; so that eventually the proportion of the heat-giving materials is augmented by nearly twenty parts, and if we now deduct the oxygen present in both factors we shall come very near to the true proportions in which the heat-giving and plastic materials ultimately stand one to the other.

In the plastic material casein, there are 6·68 of oxygen, which deducted from the thirty-one parts present, leaves 24·32 for the figures representing this portion of the food.

In Butter there are... ... 3·82 }
and in the Sugar......14·65 } Parts of oxygen, which deducted

18·47

from the total amount of heat-giving material, *i. e.*, 66·80 will leave 47·33.

47·33

for the true number ; and lastly, if in consequence of its double function, we add the twenty parts yielded up by the tissue when broken down, we obtain again nearly the same figures 67·33 for the total of heat-giving material and 24·32 for the plastic material, which approximates to three parts of the former to one of the latter. According to this view of the question, which I believe to be only an expression of facts, if we take milk as the standard by which our dietaries are to be regulated, the proportions range between two and three parts of heat-giving materials to one of formative or reparative. This does not differ much from the proportions arrived at by Dr. Christison and quoted by Dr. Wyndowe ; but as I have not seen the paper referred to, I do not know whether Dr. Christison's results were derived from observations and practical experience of the effects of dietaries, or whether from reasonings founded on data afforded by physiology and chemistry. However this may be, it is satisfactory to find that an independent train of research leads to conclusions not very dissimilar ; but notwithstanding this, I should, I think scarcely do justice to my own convictions on this subject, if I did not here candidly state that on other grounds, I conceive that generally speaking and except in special cases, the proportions here obtained are rather too high, or I should say unnecessarily high as regards the plastic material. 1st, it is to be borne in mind that the standard taken (the best no

doubt) is one applicable specially to the young and growing animal which requires a larger relative amount of plastic material than the one full grown; 2ndly, the proportions of the plastic compared with those of the heat-giving material to be found in the cereals and leguminosæ, which (with some exceptions in the latter class) seem to be prepared for and appointed by Divine Wisdom as a large portion of the food to be consumed by man, range from between one to four, and from one to seven; 3rdly, the proportions of these two kinds of food required to maintain health and strength differ according to so many circumstances and conditions, that it would be most unphilosophical to lay down any absolute rules. In a very cold country, it is a well known fact that the inhabitants drink oil and eat fats to an extent that is to us disgusting to think of; they can also consume large quantities of alcoholic fluids almost with impunity, or at least without suffering to the same extent that those who live in warmer latitudes do. The reasons for these peculiar wants and capabilities are obvious; there is an excessive demand on account of the low temperature of those regions for heat-giving material, and therefore the consumption of oil, fat, and alcohol, which all-powerfully assist in preserving the temperature of the animal at the normal standard, although every thing else about him may be many degrees even below the freezing point of water.

The legitimate inferences to be drawn from the facts given, as well as from a host of others that might be adduced, tend to prove that the highest dietaries should contain from two to three parts of heat-giving materials combined with one of plastic, while the lower dietaries range from between four to seven heat-giving combined with one of formative or reparative material. In accordance with the principles which have here been traced out, by taking as a guide the proportions present in milk and in those grains which appear to have been specially prepared for man's use, the Medical Officer will it is presumed, at all times be able satisfactorily to regulate the diets of his patients.

With reference to the other questions conveyed in the letter of the Principal Inspector General, I shall endeavour to reply to them as succinctly as possible. The first is the propriety of establishing a more uniform dietary for prisoners. I do not understand by this expression, such a table as that laid down by Mr. Rohde.

"Raggy, 35 Rupees weight or cholum 40 Rupees weight.

Rice, 20 Rupees weight.

Meal of dholl, green-gram, or other legume 5 Rupees weight, condiments, &c. at the present rate, at the discretion of the Medical Officer in charge."

Such uniformity indeed would be opposed alike to Science and practical observation, inasmuch as it lays down a fixed weight of particular grains as the invariable food of prisoners; leaving nothing to the discretion of the Medical Officer but the condiments.

Whether 60 or 65 Rupees weight of grains exclusive of condiment be sufficient or insufficient for the generality of prisoners in this country, I will not presume to affirm or deny, but I have no hesitation in saying that the question if it is to be determined on scientific principles cannot be disposed of in this manner. Careful observations by means of the weighing machine, as well as by determinations continued through equal periods of time, on the amount of urea (the representative of the tissues that have been disintegrated) passed out of the system daily require to be made, as well as determinations of the carbonic acid expired through the twenty-four hours, in order to form a just estimate, or even an approximation to an estimate of what is going on in the human organism, while living on any particular diet. It appears obvious that as one person's frame is much heavier than another's; that as one man's tissues are much more developed and pronounced than another's; that as one man's pulse is fuller and quicker constitutionally than another's; that as one man's digestion and assimilative powers are much greater than another's; that as one man's vital actions generally are more rapid than another's; that as one man's activity is much greater than another's, and that consequently there is constantly a greater disintegration of tissues, there must be greater requirements in such instances: and if this be true, it is not easy to understand, how one uniform scale can be universally applicable.

Mr. Rhode is perfectly right in all he says with reference to the value of raggy; if I may be allowed to quote my own analysis, it will be found that raggy contains a larger amount of nitrogenous matters than the other cereals, vide Medical Reports for 1855, published by the Medical Board under the sanction of Government, in which at page 146 there is a tabular view of the nitrogenous and non-nitrogenous ingredients contained in four of the most valuable Indian grains, as well as of the inorganic constituents in one hundred parts.

The following is the table referred to :—

Grains.	Nitrogenous ingredients.	Non-nitrogenous ingredients.	Inorganic ingredients.
Raggy	18·12	80.25	1·03
Cholum	15·53	83·67	1·26
Cumboo...	13·92	83·27	·73
Rice	9·08	89·08	0·47

This shews why the raggy is so much more valuable than rice. It contains as nearly as possible just double the amount of formative or reparative material. In Dr. Wyndowe's proposed diet table, dholl, a grain that may be assumed to contain a considerable amount of plastic or nitrogenous matter in the form of legumin or vegetable casein, replaces the raggy ; his table is constructed, not only in accordance with the advanced state of chemical science, but evinces moreover by introducing as much variety in the daily food as the means at his disposal would permit of, that professional knowledge of the subject which in making adjustments of this kind agreeably to the requirements of peculiar individuals or classes is so needful, and so peculiarly the province of the Medical man.

WELLCOME
LIBRARY
INSTITUTE